ELECTRICAL WEST

January 1952
25 Cents

Service is Our Business, Page 59
Appliances, Page 83

SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED REGION OF THE U. S.

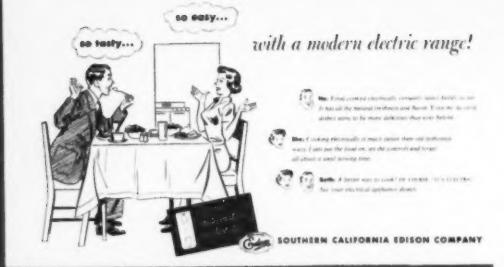
Sounds reasonable!

There are some things you can shine up, display attractively and sell to casual shoppers. But an electric range isn't one of them. Ranges aren't bought on impulse, as a general rule.

What is more, a husband's reasons and a wife's reasons for selecting a range are usually different. Tastier meals and punctual mealtimes are right down his alley. Less time in the kitchen and a mounting reputation for menu excellence are the things which ring the bell with her.

Which one should be sold? Both!

In Central and Southern California, dealers are finding this double job made easier by Edison electric range advertisements like the ones shown here. They point out the advantages of electric cooking, with both sets of reasons included.



SOUTHERN CALIFORNIA EDISON COMPANY

GENERAL ELECTRIC COMPANY

TRANSFORMER AND ALLIED PRODUCTS DEPARTMENT

100 WOODLAWN AVENUE, PITTSFIELD, MASS . . . . . TELEPHONE 8211

December 3, 1951

SUBJECT: New ASA Recommended Standards for Transformers

MEMORANDUM: To all G-E Transformer Specialists and readers of Electrical West

The transformer standards recommended by the American Standards Association (C-57 Sub-committee, 1st report - 6th draft) do not materially affect the policies of this department.

We achieved the first effective standardization of power transformers in 1944 when we introduced our Repetitive-Manufacture line. The new recommended standards are, in a sense, a realization of these early efforts.

The kva ratings, voltage ratings and most accessories approved as standard by ASA have been available for some time as part of General Electric's "RM" line. Some minor modifications in base construction and location of accessories will be necessary for complete conformance with ASA Standards.

Customers desiring ASA standard transformers may order immediately. The necessary modifications will be made at the time of manufacture. Delivery and price advantages will be the same as those for present RM transformers.

W. S. Ginn

W. S. GINN
Manager of Sales
Transformer & Allied Products Dept.

JANUARY 1952

SPOKESMAN FOR MOST HIGHLY ELECTRIFIED REGION OF THE U. S. The all-industry magazine of progress, established 1887, and incorporating the "Electrical Journal," "Journal of Electricity, Power and Gas" and "Journal of Electricity." Contents copyright. Sixty-third year of publication

VOL. 108 NO. 1

ELECTRICAL WEST

George C. Tenney, Editor
W. A. Cyr, Associate Editor — Walter C. Heston, Engineering Editor
Peggy Boyer, Assistant Editor — John Cootz, Typography

Outlook for '52

The February issue, as usual, is our annual statistical and review number. Accomplishments of the utility industry for 1951 will be chronicled and utilities will set forth in their own words their budgets and plans for 1952. There is another big year ahead for the industry of the West, with record spending and sustained high-tempo construction programs planned.

New generation brought in for 1951 and that planned for the next five years will be covered in Electrical West's exclusive feature, "Calendar of New Generation."

Sales accomplishments of the utilities during the past year and plans for 1952 are equally important to many in the industry. This phase of industry activity, as usual, will come in for statistical and review treatment.

Sales plans for 1952 will be of particular interest in view of the tightening materials situation. News of this situation is also currently treated in the News Letters of each issue.

In addition to this Western summary of industry accomplishments and outlook, there will be the usual national statistics added to those for the West.

Also, there will be the usual coverage of association meetings and industry events.

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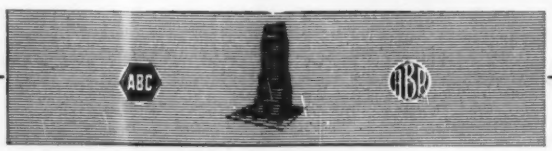
Cover photo: Truck-mounted crane for San Francisco Bay bridge servicing

ADVERTISING REPRESENTATIVES

Chicago (11) ..... Michael I. O'Connell, 520 N. Michigan Ave.
Cleveland (15) ..... Frank J. Seiler, 1510 Hanna Bldg.
Los Angeles (17) ..... Carl Dysinger, 1111 Wilshire Blvd., MA 6-4323
New York (36) ..... Walter Klein, 330 W. 42nd St.
San Francisco (4) ..... Tom Carmody, Dick Alcorn, 68 Post St., DO 2-4600



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L-M's *New* Non-Reclosing Attachment for Kyle® Reclosers

GIVES GREATER SAFETY FOR MEN AND EQUIPMENT... GREATER SAFETY IN HOT LINE WORK

L-M's new Non-Reclosing Attachment provides lockout of the recloser on the first fast operation. Should an accidental contact or arc occur while men are working on the line, the recloser opens instantly and stays open, instead of continuing through the usual complete four-operation sequence.

This new attachment provides the same protection out on the line that has been available only on substation breakers. It permits hot line work with far greater safety to men and equipment. The attachment is available at a small extra cost on all Kyle reclosers.

For complete information ask the L-M Field Engineer or write Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

72

The Non-Reclosing Attachment lever is under the sleet hood next to the regular reset handle. Pulling down the lever puts the attachment into operation but *does not* open the line. When work is completed the lever is pushed back up—and the recloser will then operate normally.

LM®

LINE MATERIAL

Kyle Reclosers

Complete Coordinated Equipment for Distribution Today

NOW... ANOTHER GREAT INSULATOR

PURIFIED

GREATER TOUGHNESS—GREATER DENSITY
GREATER MECHANICAL and ELECTRICAL UNIFORMITY

More than half a century of experience has gone into the creation of VICTOR PURIFIED PORCELAIN—the wet process porcelain of highest insulation values, unequalled density and rock-like strength and resistance to impact. Laboratory tests prove it to be the finest insulator porcelain ever made!

VICTOR PORCELAIN Is Truly PURIFIED

1. Only premium grades of flint, feldspar and clay are used.
2. Every shipment is stored in separate bins and tested for purity and uniformity before using.
3. All clay is de-aired to achieve porcelain of maximum density.

AND NOW... **all water used in processing is de-mineralized to remove the mineral salts which fuse during firing into microscopic, glass-like impurities!**

RESULTS: **Increased Impact Resistance... Greater Density... Greater Manufacturing Control... Greater Product Uniformity!**

DON'T SETTLE FOR ANYTHING LESS THAN VICTOR PURIFIED PORCELAIN
Get All the Facts from Your VICTOR Representative

V

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Boston (Westwood), Mass.

T. B. Daily
New York, N. Y., Jersey City, N. J.

John J. Herrity
Washington, D. C.

L. Morris Landers Co.
Atlanta, Ga., Charlotte, N. C.

Continental Sales & Engineering Co.
Pittsburgh, Pa.

Public Service Supply Co., Inc.
Cleveland, Ohio

H. J. Schwarberg
Cincinnati, Ohio

L. M. Rudbeck
Indianapolis, Ind.

David D. Schneider
Louisville, Ky.

Southland Sales Agents
Memphis, Tenn.

Braisted & Bair
Detroit, Mich.

Gaide & Dunlap
Chicago, Ill.

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H. R. Koch Co.
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F. R. Hearn Co.
St. Louis, Mo.

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Kansas City, Mo., Des Moines, Iowa
Oklahoma City, Okla.

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Geo. E. Tarbox Co.
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Boise, Idaho

Conely Engineering Co.
Salt Lake City, Utah

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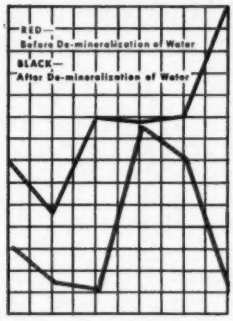
Los Angeles, Cal., Portland, Ore.
Spokane, Wash., Seattle, Wash.

ADVANCE FROM VICTOR — PORCELAIN!

VICTOR PURIFIED PORCELAIN

Finest Insulator Porcelain Ever Made!

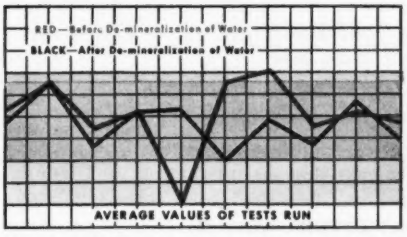
LABORATORY TESTS PROVE IT!



Results of Mechanical Impact Tests

MECHANICAL IMPACT TESTS*

Removal of mineral salts from the water used in processing VICTOR PURIFIED PORCELAIN results in an average of 18% higher mechanical impact values. The graph at the left shows actual values obtained from tests preceding and following installation of water de-mineralizing equipment.



Results of M & E Strength Tests Showing Range of Variation

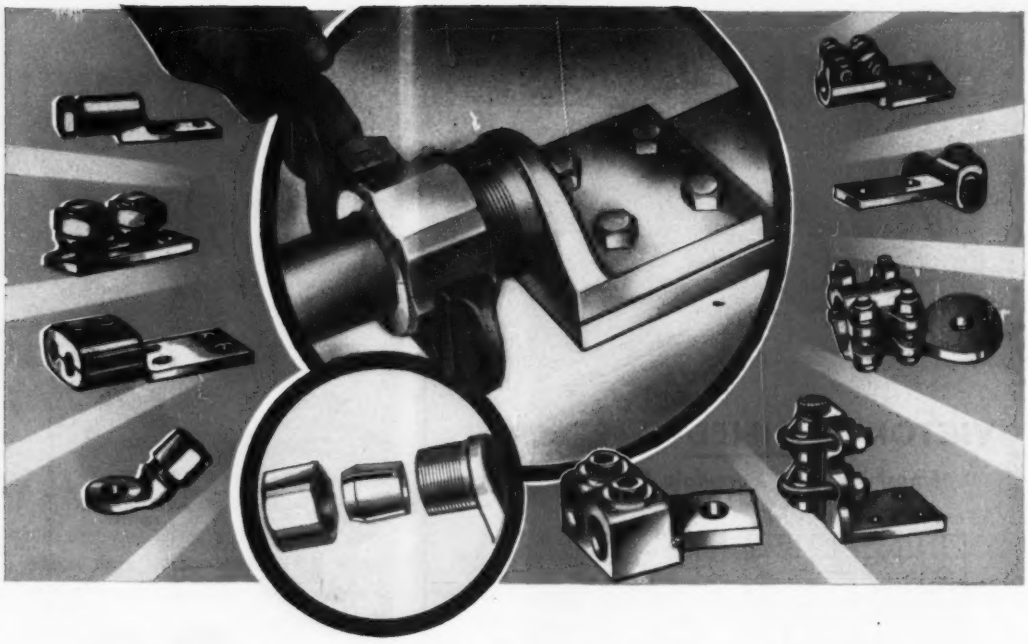
M&E STRENGTH TESTS*

Installation of water de-mineralizing equipment shows an improvement of 24% in the range of variation of M & E strength values over the range obtained before installation of this equipment. The graph above indicates the remarkable increase in uniformity of product.

*Tests made on VICTOR 10", 15,000 lb. suspension insulator.

VICTOR INSULATORS

VICTOR INSULATORS, INC. • VICTOR, NEW YORK



You always find the EXACTLY RIGHT TERMINAL—in the Complete line

Shown above, at center, is one of the various Multi-Slit Tapered Sleeve lugs in the Penn-Union catalog. You'll also find E-Z lugs with Post-and-Nut, Vi-tite, Multifit, and numerous clamp types. These pictures can merely suggest the variety.

Below are shown Thread-On, Shrink-Fit and screw types, soldering lugs, a wide selection of sheet metal terminals, etc. *Penn-Union makes the terminal you need.*

Also, Tee Connectors; Cable Taps; Straight, Parallel, Elbow and Cross Connectors; Bus Supports, Clamps, Spacers; Grounding Clamps; Service Connectors, etc.

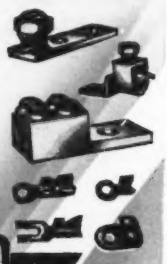
Penn-Union fittings are the choice of leading users, who have found that *if Penn-Union made it, it's dependable*—mechanically and electrically.

KENNETH ANDERSON CO.
412 Seaton St.
Los Angeles

NORTHWESTERN AGENCIES
4130 First Ave., South
Seattle, Washington

F. M. NICHOLS CO.
140 Spear St.
San Francisco

PENN-UNION ELECTRIC CORP.
ERIE, PA.
The Complete Line of Conductor Fittings



PENN-UNION

Facts from MONTANA

"'CSP' Transformers cut failures 50 to 1"

"We have been using 'CSP' Transformers for the past ten years," says a Montana Utility. "One of our divisions now has about 1,000 'CSP' Transformers in service, and an equal number of the conventional type.

"Of all our 'CSP' Transformers, we have lost but one from lightning. During this 10-year period, we have been losing an average of five conventional transformers per year. That means a ratio of approximately 50 to 1 in favor of the 'CSP'."

Old standards for judging transformers were discarded when the "CSP" (Completely Self-Protecting) Transformer was introduced. The "CSP" Transformer, with both lightning and thermal protection built in, has slashed costs, cut maintenance, and improved service continuity. Its reputation has been won by performance in the field, in instances like this one—records that have made it first choice with utilities coast to coast.

Installation and maintenance costs for Westinghouse "CSP" Transformers are always lower, because complete protective equipment is built in, not separately mounted. A two-year survey of Electric Light and Power Companies developed the National Averages shown at left.

NATIONAL AVERAGES

	"CSP"	Conventional
Installation Costs	$13.87	$24.74
Burn-out Rate	0.257%	1.005%
Fuse Outages	None	5.64% @ $6.52 per outage
Load Checks	Automatic	12.8%
Breaker Reset	1.02%	None

If you'd like to check your own costs against these national averages, ask your Westinghouse representative for Booklet B-4247-B, "Transformer Costs and Their Relation to Profits". Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

"CSP" devices . . . originated and patented by Westinghouse

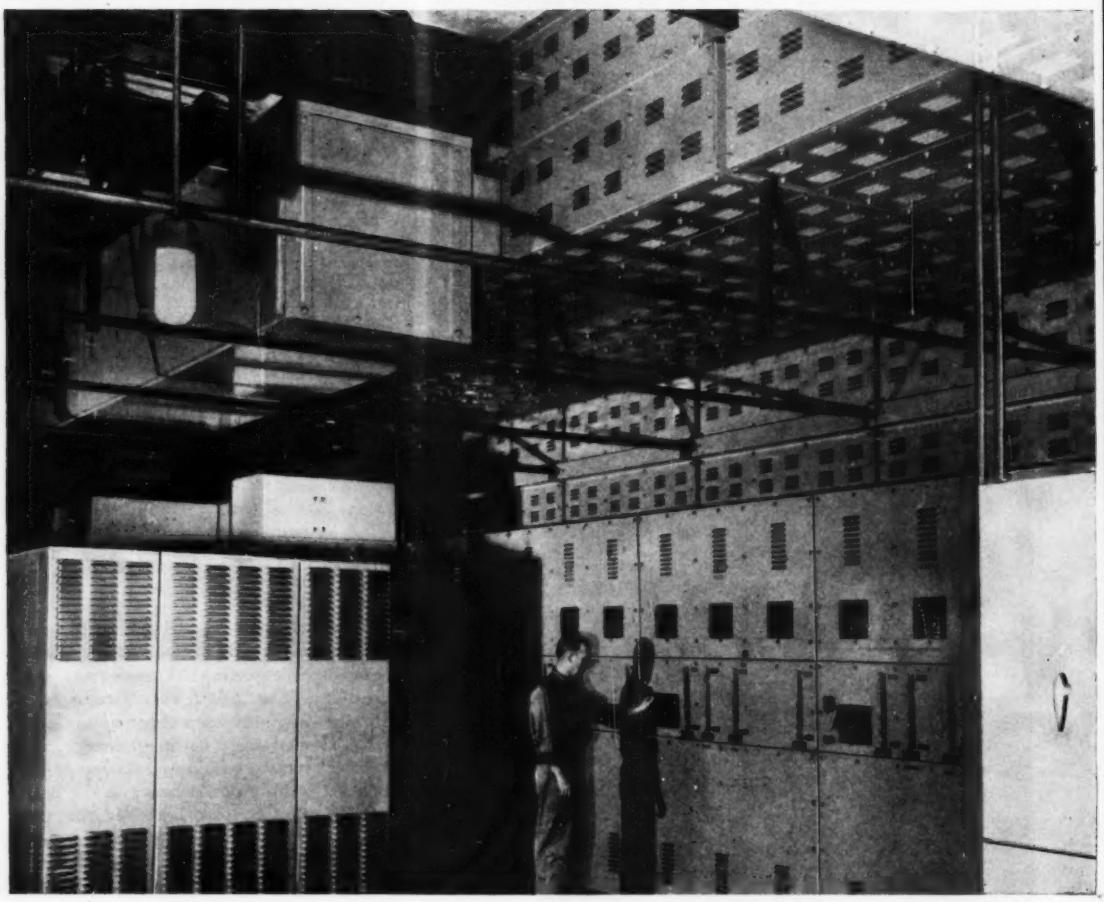
YOU CAN BE SURE... IF IT'S Westinghouse

"CSP" DISTRIBUTION TRANSFORMERS

J-70591-A

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

Switchgear for your entire station



COMPLETELY METAL-ENCLOSED COMPONENTS INSTALLED AS A UNIT. These units are part of over-all switchgear project. Attendant inspects cable entrance compartments. Note metal-enclosed bus overhead, potential transformers upper left, synchronizing reactors at lower left.

An outstanding example of

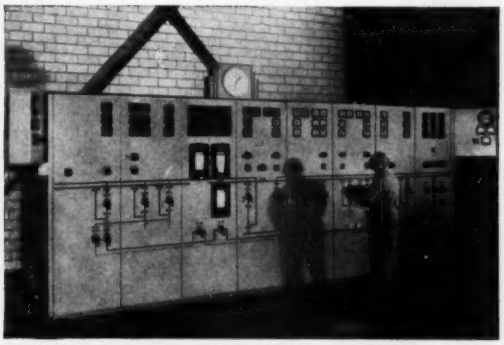
Project Planning

These General Electric, metal-enclosed equipments greatly simplify the planning of modern power stations. Installations may be made more compact. Complete enclosure in metal gives you greater safety and dependability.

Each of these metal-enclosed equipments is a completely co-ordinated unit—factory assembled and tested, shipped ready to install. Complete use of standardized G-E units permits an over-all co-ordination that may simplify your entire station design. For further information see your local G-E sales office or write to General Electric Company, Schenectady 5, New York.

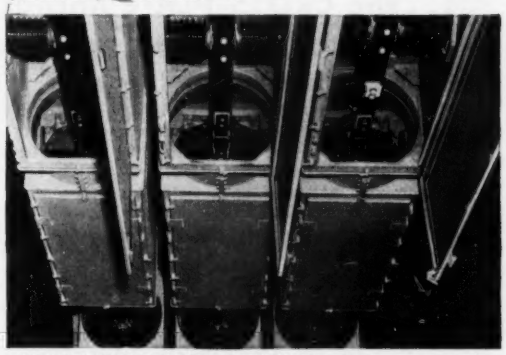
ordered and installed as one unit

METAL-CLAD EQUIPMENTS with Magne-blast circuit breakers for medium capacity circuits. Factory-assembled and completely coordinated, they include circuit breakers, buses, interconnections and interlocks—all in one compact package.



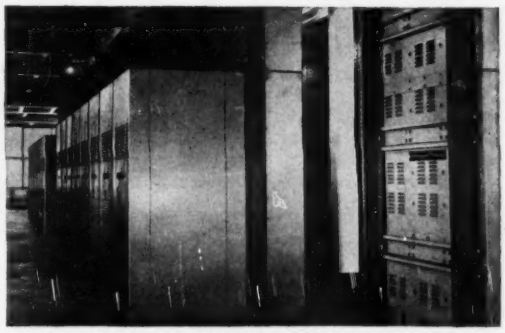
METAL-ENCLOSED DUPLEX SWITCHGEAR for centralized control and metering. These complete, factory-assembled units have control and indicating equipment on the front panels and recording, regulating and protective equipment on the rear.

METAL-ENCLOSED CABLE ENTRANCE COMPARTMENTS for the local power feeders. They include cable potheads and group-operated disconnect and grounding switches which permit easy isolation of the cable during maintenance.



METAL-ENCLOSED ISOLATED-PHASE BUS for all primary connections. Designed to withstand heavy-duty, high-capacity short-circuit stresses they are completely assembled and ready to install with other components.

METAL-ENCLOSED AIR-BLAST-CIRCUIT-BREAKER CUBICLES for main power circuits. Features included phase-segregation, mechanical interlocks, and silver contact surfaces. Available also with low-oil-content circuit breakers.



METAL-ENCLOSED REACTOR EQUIPMENTS factory-assembled with ventilated, grounded steel compartments—all ready to interconnect with metal-enclosed bus. Hinged doors provide easy accessibility for inspection and maintenance.

GENERAL ELECTRIC

855-27

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

Build LINE SECURITY *with* CHANCE ANCHORS

. . . the Steel 8-WAY Expanding Anchor holds all the way around. More Anchor for Less Money.

This anchor expands to form a cone-shaped square with *no wasted area between blades.* The load is carried by eight rib-reinforced blades that fit together closely. Compare the 8-Way with any expanded two, three or four way anchors and you'll understand one reason why this anchor outsells all others.

Another important reason for the popularity of the 8-Way is the simple construction that makes it light in weight—easy to handle, install and expand, and makes it less expensive than other expanding anchors. Available in 6″, 8″, and 10″ diameters with 70 to 200 square inch expanded areas.

. . . the CROSS-PLATE Anchor installs in vertical or angled machine-bored holes. Cuts costs.

New transmission lines in the Western states are being guyed with the Chance Cross-Plate Anchor, designed for installation in machine-bored holes. This anchor consists of two pieces of heavy steel with reinforcing ribs and flanges, welded together, with a nut retainer riveted on the bottom to aid installation. Several Cross-Plates can be carried in the space required for one dead-man anchor. They are lighter in weight, easier to handle, and less expensive to install. Available in 13″ and 16½″ plate sizes. Dipped in corrosion-resistant asphalt paint.

NEVER-CREEP | ROCK | STEEL CONE | STEEL SCREW | SWAMP SCREW | WRENCH SCREW | EXPANDING POLE KEY

There's a CHANCE ANCHOR for every kind of guying job!

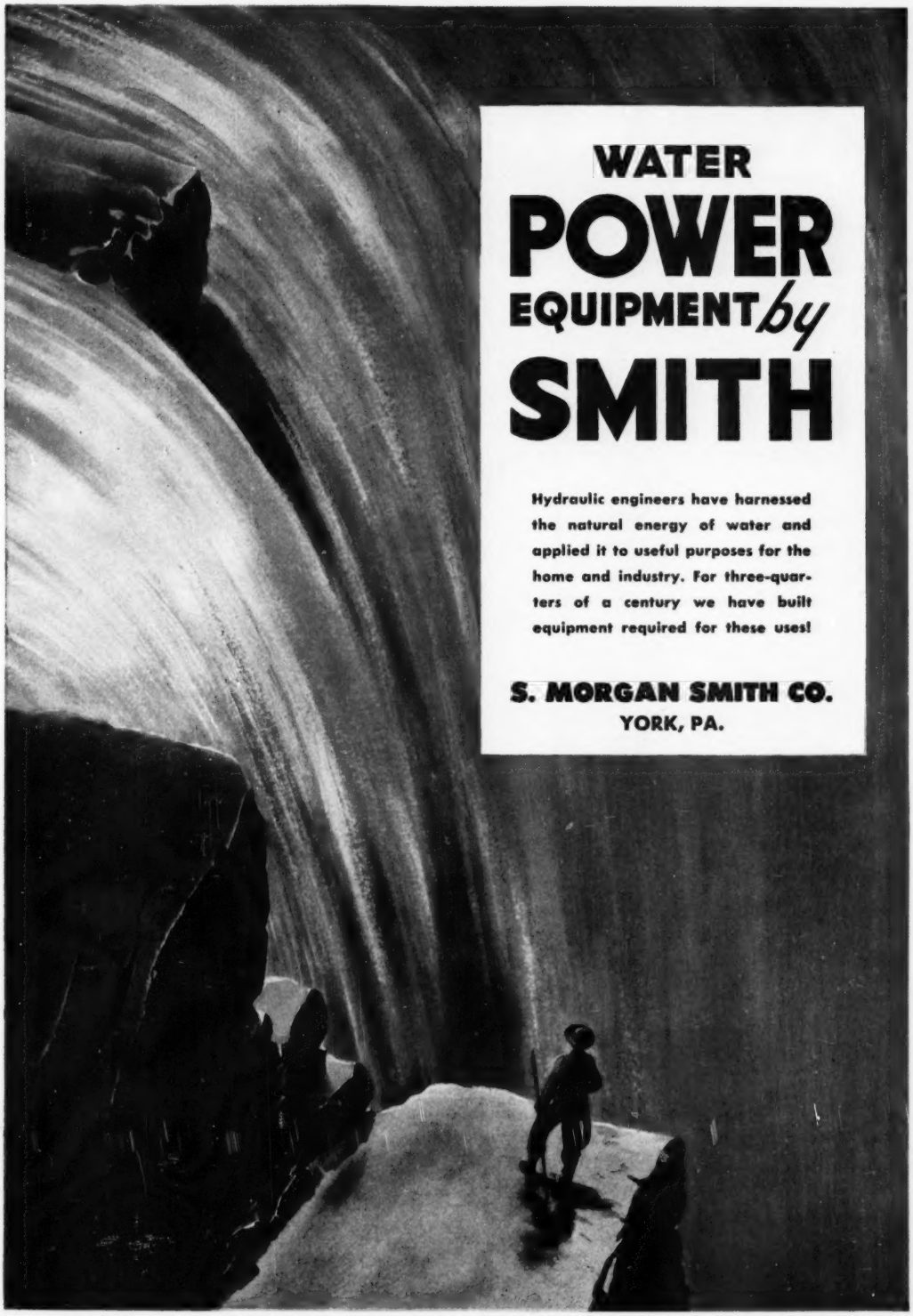
It pays to select the anchor best suited to the soil and guying condition. You can do this with the Chance line. Whether soil is sandy, clay, rocky, loam, swamp or solid rock; whether guying space is limited or unlimited; whether the line is light distribution or heavy transmission, there's a Chance Anchor that will do the job *just as it should be done.*

C52-2

A·B·CHANCE CO·

CENTRALIA, MISSOURI · SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES


WATER
POWER
EQUIPMENT by
SMITH
Hydraulic engineers have harnessed the natural energy of water and applied it to useful purposes for the home and industry. For three-quarters of a century we have built equipment required for these uses!
S. MORGAN SMITH CO.
YORK, PA.

no description needed...

those who use **General** *switches*
know WHY—
they are without equal!

General
Switch Corp.
49 Roebling Street Brooklyn 11, N. Y.

WRITE FOR CATALOG #5201

ENCLOSED SAFETY SWITCHES · BRANCH CIRCUIT PANELS · SERVICE ENTRANCE EQUIPMENT

Announcing Low Cost...

OVERLOAD INDICATOR

DISTRIBUTION TRANSFORMERS

ONE OF THE MOST IMPORTANT advantages of the new A-C distribution transformer overload indicator is that it operates purely as a signal. This warning device locates overloaded transformers visually, but does not in any way interrupt service to your customers. And when poor voltage conditions are corrected, naturally customer relations are improved. The warning device is simple, reliable, quiet in operation and low in cost.

Use of the overload indicator enables you to schedule the replacing of overloaded transformers during daylight hours. It will save you money on the maintenance and replacement of transformers and prevent costly burnouts.

OPERATION IS SIMPLE

Operated from a simple thermal device located in the top oil, the warning signal lights up brilliantly when the transformer becomes moderately overloaded. It remains lighted until reset with the convenient external handle.

The Allis-Chalmers overload indicator is available on distribution transformers of any rating.

Why not investigate the advantages of Allis-Chalmers distribution transformers with the overload indicator today. Simply call your nearby A-C district office or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-3543

Here's What Utility Men Are Saying:

"Its big advantage is that it warns of overloads but doesn't interrupt service. That means better customer relations for us."

"The new indicator is a low-cost substitute for our expensive load surveys. We can make definite savings in overhead costs."

"We like it from an engineering standpoint. It's a well-designed warning system . . . well engineered and well calibrated. And it is built right *into* the distribution transformer at the factory."

ALLIS-CHALMERS

can't rattle!
L-M's new
GUY WIRE
PROTECTOR
clamps guys firmly
can't twist!
1. Good tight anti-rattle hooks grip any strand from ¼" to ½" firmly and permanently.
2. Body is 18-gauge steel, heavily L-M-hot-dip galvanized to assure long-lasting protection.
3. Rounded edges add rigidity and safety. No rough edges to cut hands or snag clothes.
4. Long 30-inch cutaway at bottom permits putting the protector over anchor rod and two 6-inch clamps—a unique L-M feature.
5. Bottom clamp conveniently tightened with bolt on the side of protector. Grips any size from ¼" strand to 1" anchor rod. No loose parts to fall out.

L-M guy wire protectors offer extra features for safety and savings. Large size, fully rounded design, and bright L-M galvanizing assure high visibility. Design speeds up the installation. Generous, easily accessible clamping assures a firm grip — it's almost impossible for the protector to rattle or rotate. In 7′ and 8′ lengths.

74

LINE MATERIAL

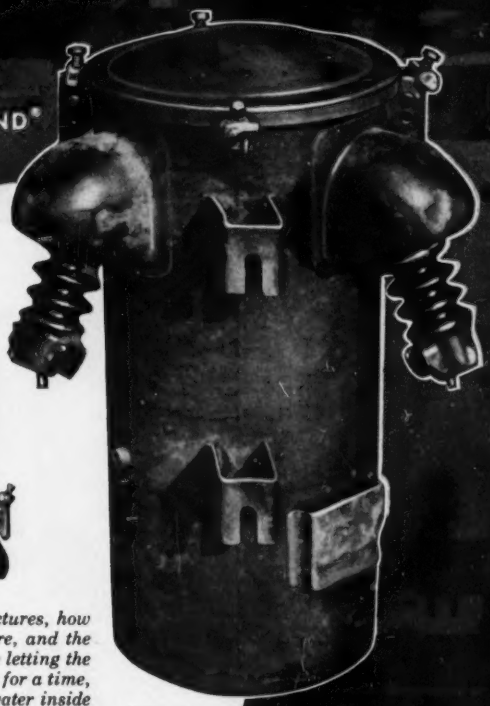
Line Construction Materials

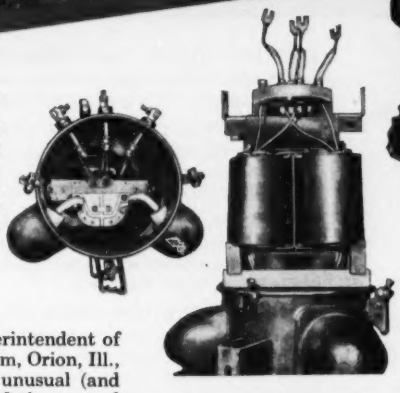
Complete Coordinated Equipment for All Distribution Requirements

FOR FULL INFORMATION on these and other L-M Line Construction Materials, ask the L-M Field Engineer—or write Line Material Company, Milwaukee 1, Wis. (a McGraw Electric Company Division).

FLOOD BATTERED...

...THEN BURIED IN MUD, THIS L-M ROUND-WOUND® TRANSFORMER IS READY TO GO RIGHT BACK TO WORK!





Battered by flood water that shattered the pole, and buried under mud and rocks, this L-M Round-Wound transformer suffered only minor damage —and there wasn't a drop of water or mud inside!

PHOTOS BY K. M. NORCROSS

K. M. Norcross, superintendent of Sherrard Power System, Orion, Ill., recently reported an unusual (and unintentional) test of the rugged construction of L-M Round-Wound transformers. Here is what he says about it:

"Last spring the Mississippi River reached its highest flood level in 20 years. Before dawn one morning the river went through a dike, taking with it one of our poles on which was mounted one of your 5 kva Round-Wound transformers.

"We never saw that pole again—until a month ago. A dragline cleaning out a drainage ditch 1500 feet away dug the transformer out from under 5 to 10 feet of mud and rocks. Two feet of the pole was still attached but was badly shattered, and the tank was badly scraped and battered—evidence of the terrific battle the transformer and pole had with the river.

"The internal condition was excellent—almost as though it had just come off the assembly line. The oil was gone and one bushing was chipped and loose—but there wasn't a drop of mud or water inside and it was obvious that the damage occurred when the transformer was dug out.

"Note, in the enclosed pictures, how clean are the coils, the core, and the inside of the tank. We are letting the core and coil out in the air for a time, just in case there is any water inside —and then we'll put it back on the line. I just thought you'd like to know how much abuse a Line Material transformer can take!"

(Signed) K. M. NORCROSS,
Superintendent

At L-M's request, the transformer was shipped to the Zanesville plant, where it was tested and found to be in perfect operating condition. The only work required was replacement of bushings, repainting the tank, and refilling with oil.

There's much more to L-M Round-Wound transformers than just rugged construction and flood-proof tank sealing. Ask the L-M Field Engineer to tell you about their superior performance characteristics and long life. Or write for bulletins. Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).

LINE MATERIAL
Transformers

RELY ON "ROUND-WOUNDS" ... BETTER ALL AROUND!

8

(1) CLEAN METALS THROUGHOUT—electrolytic "scrubbing" removes all foreign particles, soap and tallow lubricants from the copper conductors, metal tapes and pressure tubes.

(2) IMPROVED CONDUCTOR SHAPE — conductor-shaping machinery has been modified to eliminate plane surfaces and small radii from the conductors. This assures a snug fit of the insulating papers, reducing ionization.

(3) USE OF METALLIZED PAPER TAPE — metallized paper tapes, wrapped over conductor and insulation improve safety factor, reduce ionization, increase break-down values, and retard thermal aging of the insulation.

(4) HIGH INSULATION STABILITY — test results on Okonite-Callender insulation show substantially better values than required by A.E.I.C. specifications. In the past ten years, not a single case of defective insulation causing cable failure has been reported.

(5) LEAD STABILIZED BY SODIUM TREATMENT — sodium treatment of virgin lead removes impurities and "stabilizes" the lead so that it does not oxidize during the sheathing operation. Contributes to a structurally sound lead sheath, free from inherent defects.

(6) OKOMETAL FATIGUE-RESISTANT SHEATH — Okometal is an arsenical lead alloy, exclusively used by Okonite-Callender. In standard bending tests, Okometal outlasts copper-silver-bearing lead over 3½ to 1!

(7) UNIFORMITY OF SHEATH THICKNESS — electronic concentricity gauge permits the enforcement of a self-imposed limit of thickness uniformity variation less than *half* that of A.E.I.C. specifications.

(8) OKOSHEATH PROTECTIVE COVERING — in 17 years, no case of sheath corrosion has been reported on any cable having an Okosheath Protective Covering, the only covering that incorporates a heavy homogeneous wall of vulcanized neoprene firmly bonded by vulcanization to the lead.

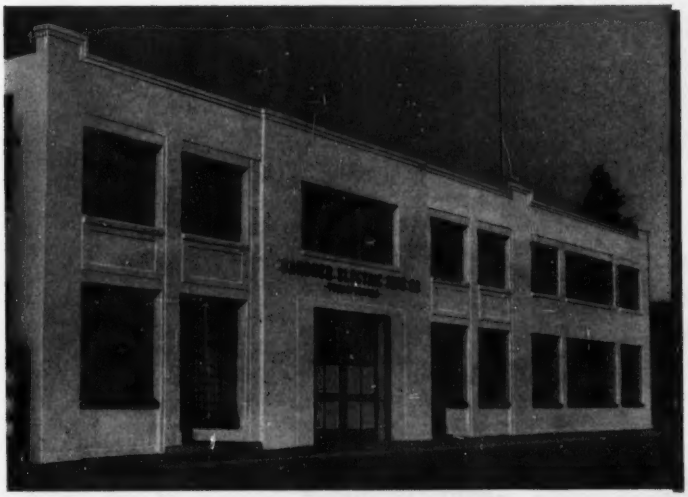
When you specify Okonite - Callender paper - insulated power cables you not only get better initial value than called for in the A.C.E.I. specifications, but you also obtain built-in features that make it possible to retain these characteristics during the operating life of the cable. Ask for Bulletin WE-1052 and get the complete story. The Okonite Company, Passaic, N. J.

THE BEST CABLE IS YOUR BEST POLICY

OKONITE SINCE 1878 *insulated wires and cables*

MANUFACTURING TRANSFORMERS IS A FULL TIME JOB

AT the *Gardner* block-long factory in Emeryville, California, making transformers is a business . . . not a sideline. *Gardner*, the largest independent transformer manufacturer in the West, is owned by the officers and executives who serve its customers. Since 1909 these trained engineers have acquired vast experience in repairing all makes of transformers, and in building *Gardner* transformers for special and standard purposes. That is why every Gardner transformer complies with A.I.E.E., N.E.M.A. and A.S.A. standards; yet each *Gardner* transformer is custom built by skilled craftsmen who understand what is required and how to achieve it with efficiency and economy.



★

Special problems are welcome. Our experience is widespread and our production line is flexible. Write for information.

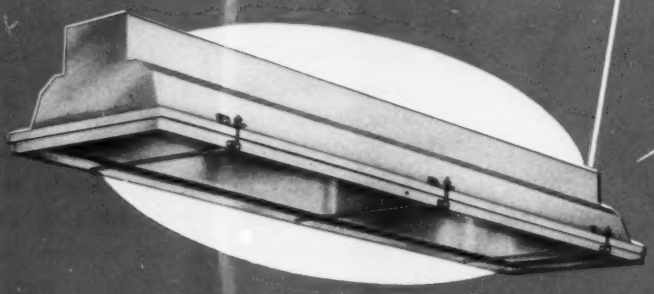
GARDNER ELECTRIC MANUFACTURING COMPANY

FACTORY AND GENERAL OFFICE

4227 HOLLIS STREET EMERYVILLE (OAKLAND) 8, CALIFORNIA

Notes on Quality LIGHTING:

Here in the West the installation assuring maximum lighting efficiency with minimum service and maintenance is, by every standard of comparison, SMOOT-HOLMAN. The hallmark of quality in better buildings is the presence of SMOOT-HOLMAN equipment.

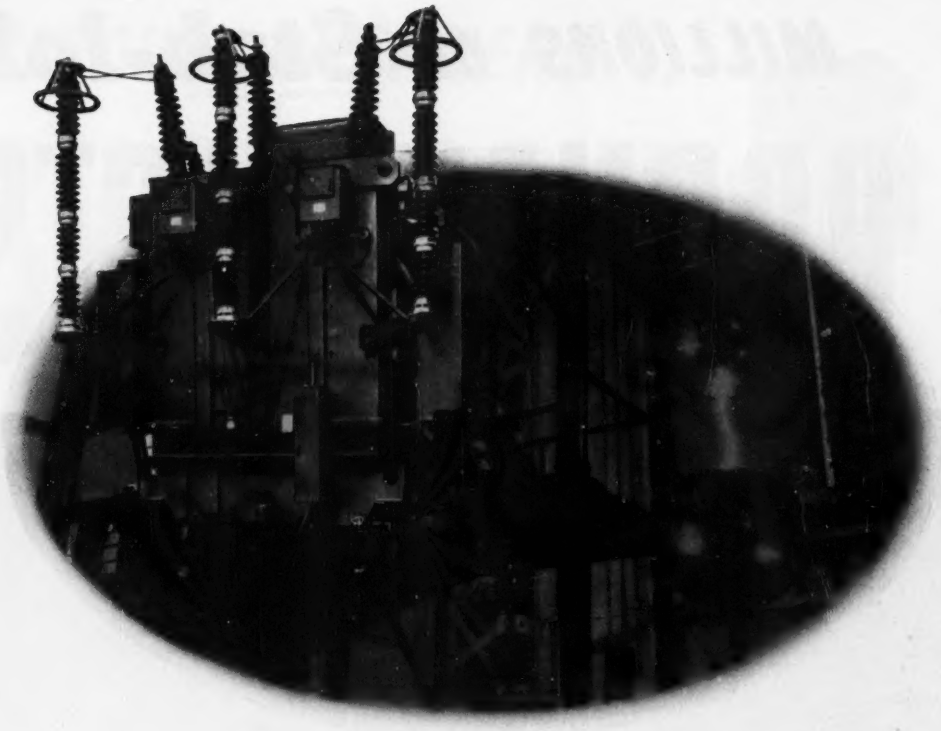


The New D-P Seal-Lux, *pictured above, is a vapor-tight fluorescent luminaire built for high efficiency and rugged service life under the most exacting conditions.*

1 Collegiate Slimline fluorescent
2 D-P Line-Light
3 Constellation Slimline fluorescent
4 Educator incandescent
5 RLM Standard Dome Reflector
6 The Master floodlight
7 LH Ceiling light

ILLUMINATION EQUIPMENT
SMOOT-HOLMAN
INGLEWOOD, CALIFORNIA
MADE IN U.S.A.

SMOOT-HOLMAN COMPANY Inglewood, Calif. Offices in Principal Western Cities • Branch and Warehouse in San Francisco



ADDED PROOF of power transformer quality

SELECTIVE SURGE TESTING ON THE PRODUCTION LINE!

Your greatest assurance of reliability is *proof by actual test.* That's why many users specify ASA and NEMA surge tests.

That's why Westinghouse engineers, too, surge test certain power transformers on the production line. In fact, it has been a production line procedure at Westinghouse for many years. Routine daily tests prove quality of design, workmanship and materials. An ever-increasing number of transformers are being quality control tested. Such tests are particularly important on transformers rated above 69 kv.

Surge testing on the line is *that extra step* that assures Westinghouse quality . . . quality that means extra dependability for you.

Your Westinghouse representative will be glad to discuss all the advantages that Westinghouse power transformers offer you. For details on production line surge testing, ask him for a copy of booklet B-5471, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

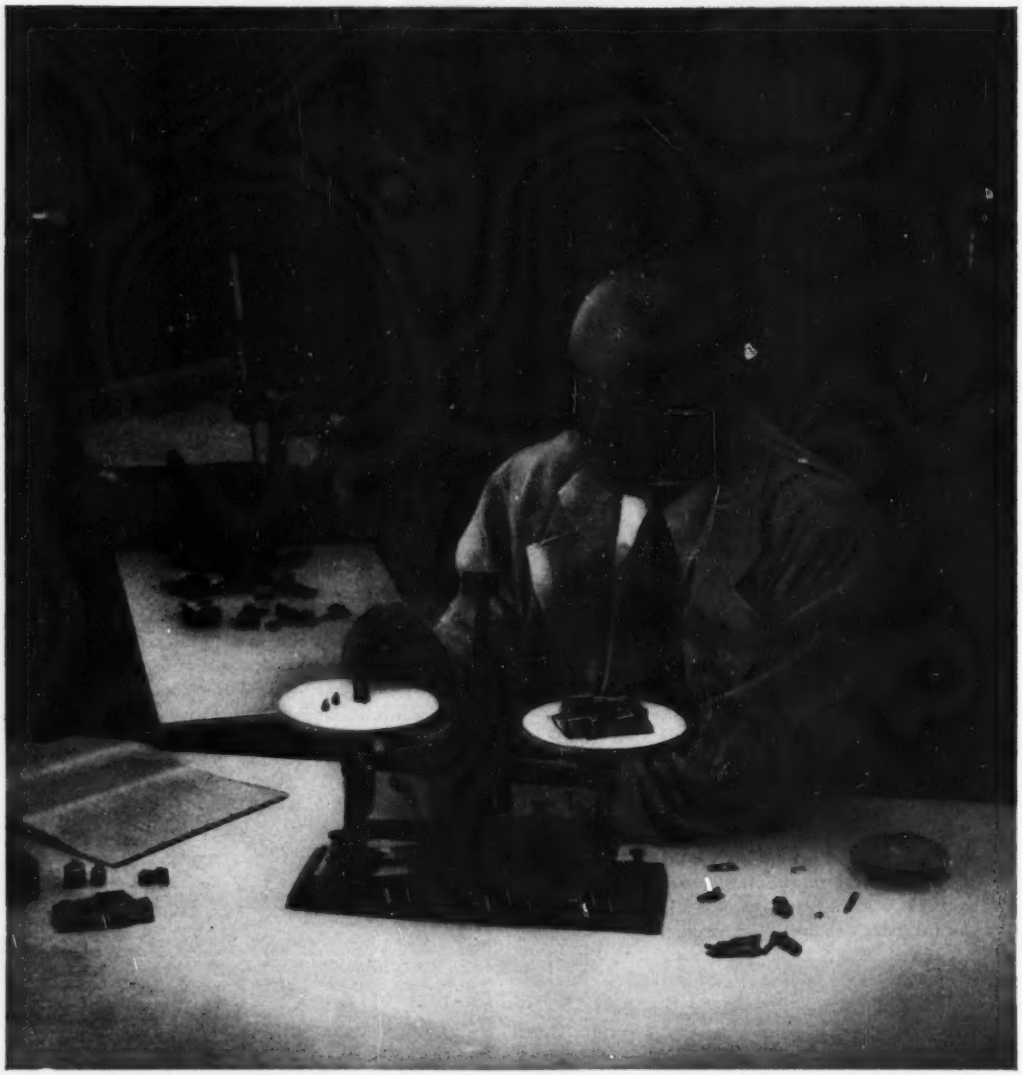
J-70621

YOU CAN BE SURE...IF IT'S
Westinghouse
POWER TRANSFORMERS

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.

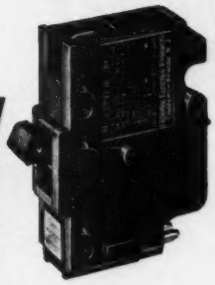
MILLIONS OF Stab-lok
REGISTRATION APPLIED FOR

PROVEN FACTS



CIRCUIT BREAKERS...

SHOW WHY



STAB-LOKS pass the same exacting Underwriters' Laboratories electrical tests as the highest priced A. C. circuit breakers. And now mechanical comparisons of the five most popular breakers give still further proof that Stab-lok gives you most for your money.

- ***Stab-lok is a BIG, FULL-SIZE CIRCUIT BREAKER!***
- ***Stab-lok has FEWER and MORE RUGGED parts!***
- ***Stab-lok uses metal where it counts – CARRYING CURRENT!***

...a whole combination of features that make Federal Noark Stab-lok the best breaker at any price.

INDEPENDENT LABORATORY TESTS OF FIVE POPULAR CIRCUIT BREAKERS SHOW:

Brand	Total No. of Parts	No. of Fibre Parts	% Total Weight	% Total Weight of Case and Handle	% Total Weight of Metal Parts	% Total Weight of Current Carrying Assemblies
STAB-LOK	**22**	**1**	**100.0**	**100.0**	**100.0**	**100.0**
C	31	5	82.2	76.8	88.0	53.8
E	24	2	83.8	80.4	83.3	48.7
B	28	1	85.4	56.0	97.6	48.7
D	31	5	82.2	76.8	88.0	53.8

Stab-loks have been on the market for only a year and a half . . . yet today millions are in service and the demand is growing by leaps and bounds. And no wonder!

Stab-lok is the lowest priced breaker on the market whose dependability has been absolutely proved in service. Now you can give customers the safest, most convenient circuit protection at fuse box prices. What's more, Stab-lok is easy to install and, thanks to Federal Noark mass production, you can usually expect better deliveries than of any other breaker.

Remember Stab-loks are an ideal stock item for your shop and trucks . . . order them from your wholesaler.

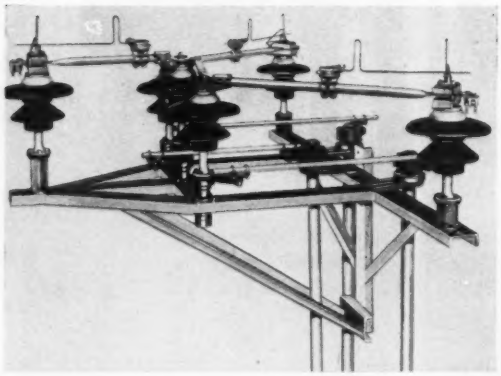
Federal Electric Products Company, 50 Paris Street, Newark 5, N. J.

FEDERAL NOARK

Federal NOARK

Complete line of Federal Electric Products includes Motor Controls, Safety Switches, Service Equipment, Circuit Breakers, Panelboards, Switchboards, Control Centers, Bus Duct ★ Sales offices in principal cities.

PRODUCT NEWS



Gang Operated Air Break Switch

(1) W. N. Matthews Corp., 3850 Delor St., St. Louis 16, Mo.

This gang operated air break switch mounts on one pole and is designed for substation switching, loop interconnections or sectionalizing. Each set of blades is individually operated. It gives the operator the advantage of doing all switching from the same point, according to the manufacturer, and provides safety in operation because there are 180° of free climbing space and different switch locations make opening or closing the wrong switch unlikely.

In field tests the 69-kv rated GOABS cleared the charging current on 61.5 miles of 66-kv lines. The manufacturer points out that critical materials and time are saved and right-of-way requirements reduced with these switches as compared with conventional air break gang operated switches mounted on H-frame structures. The new switches come in 15-, 23-, 34.5-, 46- and 69-kv 600-amp ratings.

Automatic Switching for Carrier Systems

(2) Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.

A new automatic simplex-tvpe switching development for power line carrier installations is claimed to be so precise in its operation that, although it operates on only one frequency, a circuit can hardly be distinguished from a well-balanced duplex circuit.

All switching is in response to speech. A fraction of a second allows for line clearance and either party may begin to talk. Once speech is started, the line is open only one way until the moment speech stops. Advantages of this type of switching over full duplex operation, according to the manufacturer, are: (1) permits party-line communication between several points; (2) operates on a single frequency; (3) does not require a press-to-talk button and circuit and so allows incorporation of automatic simplex operated circuits into standard telephone systems.

Major features listed are speed of operation; freedom from click; inclusion of asymmetrical time constant circuits whose operation in the direction of closing has different time constants than when opening.

According to the manufacturer, the electronic transfer unit uses no relays because relay operation is considered too slow. Because the blocking and actuating of both the transmitter and receiver had to be done electronically, the transfer unit was first designed and transmitters and receivers were then designed to work in conjunction with it. The unit automatically begins operation two milliseconds after speech is started; transmitter is started two-fifth of a millisecond later.

Resistance Thermometers

(3) General Electric Co., Schenectady 5, N. Y.

A new line of resistance thermometers for indication and control of temperatures from —100 to +300 F is available in three basic types: the HP-11 resistance-thermometer indicator; the HP-13 2-position controller or protector and the HP-14 3-position controller. Each type is for flush or surface mounting. All the thermometers use the same basic mechanism, a crossed-coil moving element and a high-strength 3¼-lb alnico V magnet. Typical uses listed by the manufacturer are with enamel baking ovens, vacuum dryers, low-temperature extruding machines, quenching tanks, distillation kettles, rubber vulcanization apparatus and aging ovens.

For Additional Information On These Products Fill in the Coupon on Page 52

The Hapco Tapered Style Bracket, of permanent, lightweight aluminum alloy, is gracefully tapered from a 2½ by 5-inch oval at the pole end to 1¼-inch standard pipe size at the luminaire end. The graceful upsweep provides a rise of 17-inches from the center of the pole mounting end to the outer end. The unique design gives considerably greater strength than 2-inch pipe of the same material. Note that the four foot size weighs only seven pounds ready for shipment.

The high strength aluminum alloy Pole Plate is welded to the arm to form a solid unit, and the exclusive Hubbard Keyhole Mounting Slot makes one-man mounting easy. Internal wiring is provided for by a slot in the bottom of the arm near the Pole Plate.

Standard numbers listed below are supplied with outer end reduced to 1¼-inch pipe size for slip-fitter luminaires or 1¼-inch standard pipe threaded fittings. If 2-inch pipe end is desired, please specify.

Stock No.		Nominal Length of Arm—Feet	Approximate Shipping Wt. Lbs., Each
Threaded End	Plain End		
HAL 4224	HAL 4224P	4	7.0
HAL 4225	HAL 4225P	5	8.5
HAL 4226	HAL 4226P	6	10.0
HAL 4228	HAL 4228P	8	14.5

HUBBARD ALUMINUM PRODUCTS COMPANY

MANUFACTURER OF HAPCO QUALITY ALUMINUM PRODUCTS

A Division of HUBBARD and COMPANY

6301 Butler Street • Pittsburgh 1, Pa.

IT'S SPANG CONDUIT CENTRAL

When construction is completed the three modern skyscrapers at Pittsburgh's Gateway Center will be equipped from top to bottom with Spang Central Conduit—a transformer to penthouse installation for power, light and communication.

Following closely on the erection of the structural framework, the main electrical arteries of Spang Cenlaco Conduit climb from floor to floor. As quickly as bays are completed, webs of Spang Central Black Conduit are laid to every outlet point.

The selection of Spang Central Conduit for these Pittsburgh office building landmarks is further recognition of Spang controlled quality conduit known and used everywhere because of its time-proved dependability and workability.

Wherever conduit is specified for commercial, industrial, or residential construction be sure to ask your distributor for Spang "Cenlaco", "Central Black", "Central White" and "Central EMT."

Owners:
The Equitable Life Assurance Society of the United States, New York, New York
General Contractor:
Starrett Bros. & Eken, Inc., New York, New York
Electrical Contractor:
Lord Electric Company, Inc., New York, Pittsburgh and Boston

SPANG

SPANG-CHALFANT
Division of The National Supply Company
GENERAL SALES OFFICE:
GRANT BUILDING, PITTSBURGH 30, PA.
District Offices and Sales Representatives in Principal Cities

Need help in protecting insulators against destructive attacks by industrial contaminants and surface dirt?

For greater flashover voltages, reduced leakage currents, easier cleaning

- - try treating your insulators with new LOCKE INSULCONE . . .

When treated with Locke **INSULCONE,** insulators operating in contaminated areas usually give much better service than untreated insulators. Make your own comparison and you're likely to find out that—

① **INSULCONE**-treated insulators, when subjected to AIEE standard precipitation tests, have flashover voltages up to 20% higher than untreated insulators.

② In mist, **INSULCONE**-treated insulators have flashover voltages 20% to 92% higher than untreated insulators.

③ **INSULCONE**-treated insulators are much easier to clean, and period between cleaning times is lengthened, because INSULCONE reduces bonding action between contaminants and insulator surface.

④ **INSULCONE**-treated insulators reduce leakage currents, with resulting decreases in pole top fires, pin burning, radio interference and hardware corrosion.

What is INSULCONE?

It's a silicone-base insulator treating fluid which is applied to insulator surfaces by brushing, dipping or spraying. It forms an even, water-repellent film over insulator surfaces. This silicone film resists the harmful effects of mist, moisture, rains, fog . . . and, being incompatible with most organic and inorganic materials, it also deters the formation of deposits on insulator glaze. The unique chemical stability of INSULCONE enables it to withstand atmospheric weathering, the charring action of leakage currents and corona streamers. INSULCONE is a trade name of Locke Department, General Electric Company.

INSULCONE comes in 1-gallon, 5-gallon and 55-gallon containers.

IN STOCK FOR IMMEDIATE SHIPMENT FROM THE WAREHOUSES OF

GENERAL ELECTRIC SUPPLY CORPORATION

SAN FRANCISCO • OAKLAND • SACRAMENTO • FRESNO • LOS ANGELES
SAN DIEGO • PHOENIX • SEATTLE • PORTLAND • TACOMA • SPOKANE

The Tea Party Proves *it's SAFE here!*

We're sure that the utility didn't propose this substation as a public playground. But with its location in the heart of a young residential area, they knew it had to be safe. That's why they installed a Westinghouse "CSP"® (Completely Self-Protecting) Power Transformer with underground lines. It makes a compact, completely enclosed single-feeder unit substation . . . so safe that it may be installed without special fences or guardrails. There are other, greater economies, too:

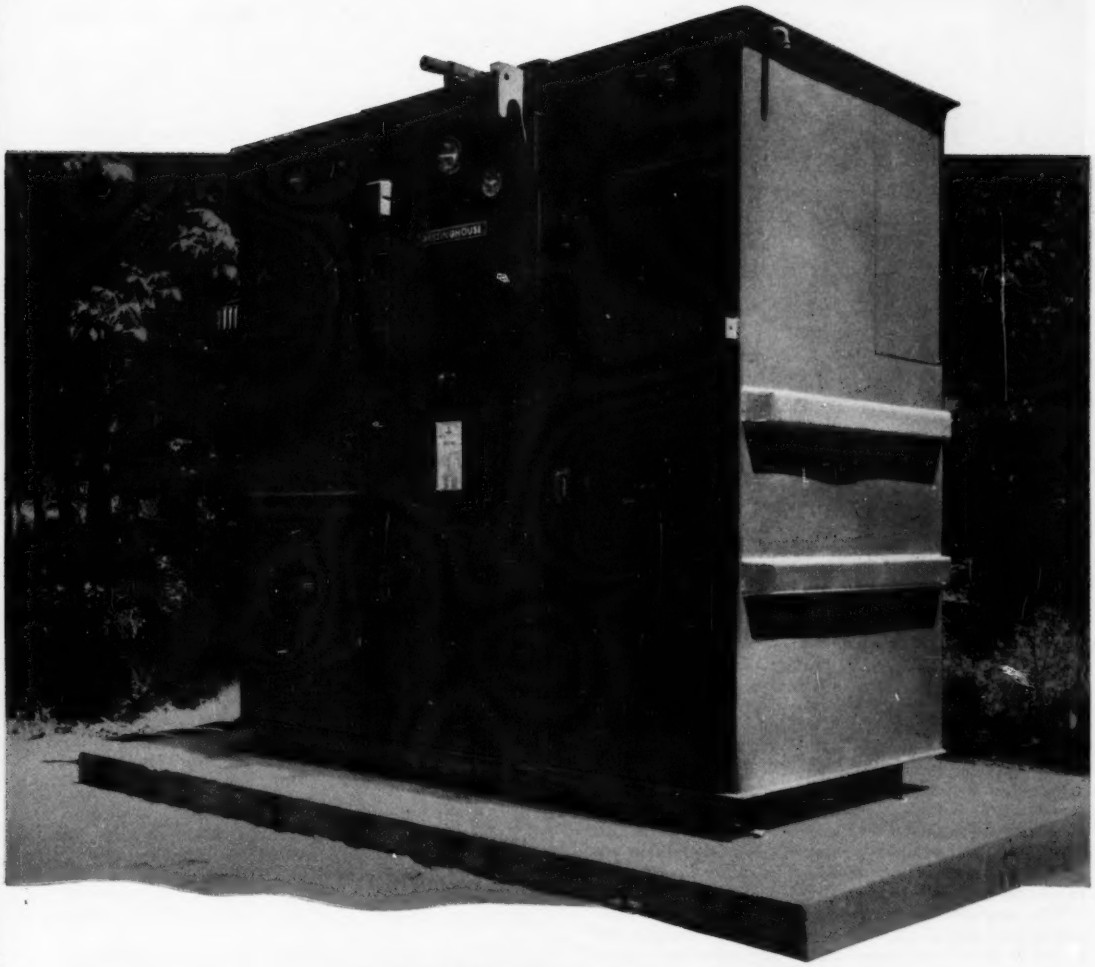
You save when you order. Specify and order just one complete unit . . . instead of 35 to 45 components.

You save when you install. Simply lay a mat, set the unit in place, and tie it in. No co-ordinating or separate mounting problems! No overhead structures! No protective barriers!

You save on maintenance and long-run operation. It's a "CSP" unit, with built-in protection. It will handle short-time overloads without service interruption and will save itself from burnout if the load becomes dangerous.

For further information, ask your Westinghouse representative for a copy of booklet B-4292, "Single-Feeder Unit Substations that are Completely Self-Protecting", or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-70603



YOU CAN BE SURE... IF IT'S

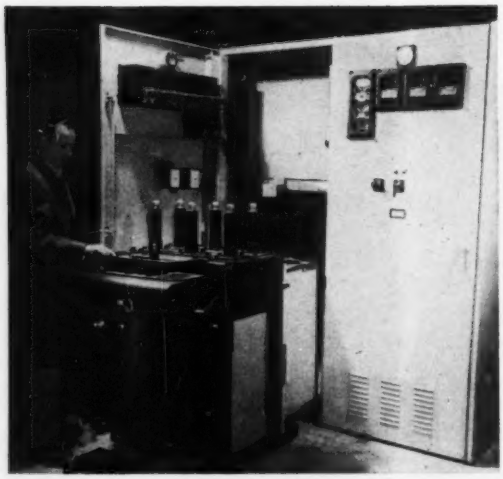
Westinghouse

"CSP" POWER TRANSFORMERS

SINGLE FEEDER UNIT SUBSTATIONS

WESTINGHOUSE

Plants at Berkeley, Calif.; Sunnyvale, Calif.; Emeryville, Calif.; Los Angeles; Portland; Salt Lake City; Seattle; Denver.



Metal-Clad Switchgear

(4) General Electric Co., Schenectady 5, N. Y.

A standard line of metal-clad switchgear in ratings from 2,400 to 13,800 v, 150 to 500 mva is said to have new and improved design features though retaining the same general arrangement of major components.

All industry standards have been retained. One of the new features is a magne-blast circuit breaker in which a maximum number of parts are interchangeable among breakers of different ratings. For instance solenoid mechanisms and many contact and arc extinguisher parts are identical in all ratings.

An electromechanical control device, built integral with the breaker mechanism, is the heart of a control circuit system that is identical for all breakers operated from the same control voltage. Auxiliary switches for noncontrol functions are mounted on the gear's stationary structure.

An improved insulating material claimed to have excellent flame-retardant, dielectric and antihygroscopic properties is used throughout the breaker.

The breaker elevating mechanism has a new positive-acting mechanical interlock and gives faster raising and lowering. All elevating mechanisms are driven by a motor that is demountable for hand crank operation and is controlled by a safety interlocked control system. Downward movement of the breaker from vibration is prevented by an anticreep device.

Coupling Unit for Power Systems

(5) Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Ill.

The Aperiodic unit for coupling carrier equipment to power lines uses an integral high-pass filter. With a flat pass characteristic above 50 kc, it permits broad-band coupling, according to the manufacturer. Any number of receivers may be coupled through one Aperiodic unit, as can any number of transmitters with up to 25 w total output power.

These units are available in voltage classes of from 34.5 to 230 kv. Included with each are a grounding switch, a drain coil, protective gaps, fuse, line tuning unit and impedance-matching transformer. Meets requirements of AIEE Spec. 31.

Split-Bus Panelette for Large Domestic Loads

(6) Square D Co., Western Division, 4335 Valley Blvd., Los Angeles 32, Calif.

The new NMO-285 split-bus panelette is a single unit that will accommodate a maximum of 28 thermal coilless magnetic plug-in type circuit breaker poles. It was designed to control large electrical loads in homes, where increasing use of heavy appliances puts more strain on the circuits. It complies with the NE Code, allowing a maximum of six subdivisions without a single main disconnecting means.

The panellette is designed in two sections. The distribution section will accommodate a maximum of 16 single-pole, individually tripped circuits for the control and protection of lighting outlets, convenience outlets, electric heaters, etc. Plug-in circuit breakers give maximum flexibility, according to the manufacturer. The service section accommodates six 3-wire SN (2 pole) sub main breakers, two of which are used as mains for the distribution section in the lower compartment, and the balance of which can be used for feeder circuits to electric range, water heater, clothes dryer, garbage disposal, dishwasher and for other heavy-duty applications.

Time-Delay Plug Fuse

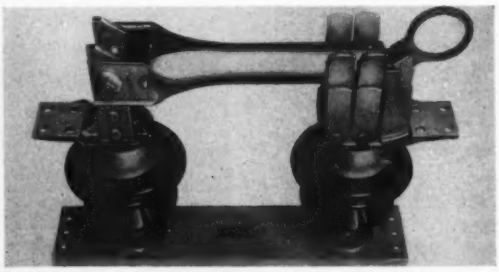
(7) Royal Electric Co. Inc., Pawtucket, R. I.

Shok-Absorber safety glass-top plug fuses incorporate a time-delay lag link of a new type claimed to absorb overloads and sudden current surges, preventing needless blowing and giving ample protection. They come individually or in packs of five.

Radiation Probe

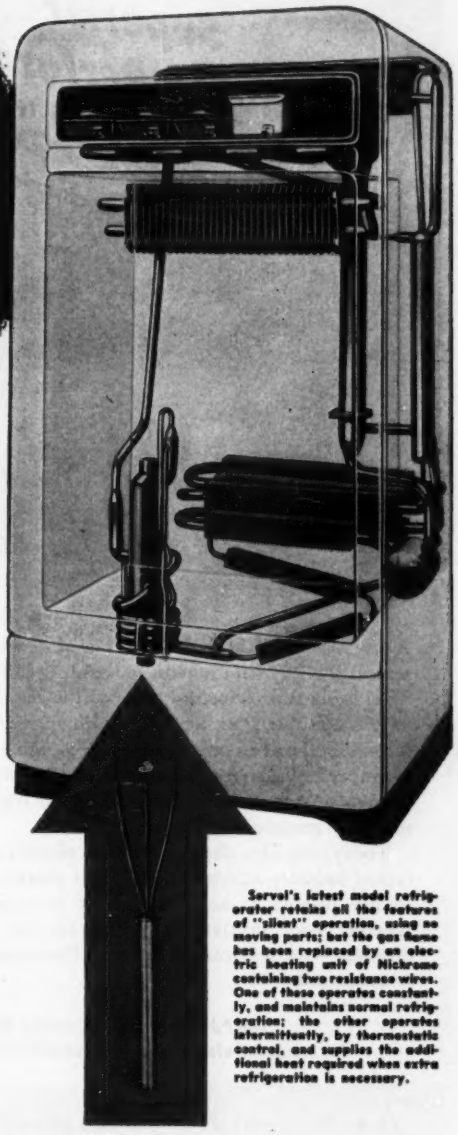
(8) General Electric Co., Special Products Division, Schenectady 5, N. Y.

A lightweight radiation probe for detecting and measuring alpha, beta, gamma and neutron radiations is for use in hospitals and industrial and university laboratories. It will monitor contamination of clothing, personnel, laboratory equipment and facilities.



(9) This new line of B-2K outdoor hook-operated disconnecting switches announced by Delta-Star Electric Co., 2437 Fulton St., Chicago 12, is said to incorporate many features formerly included only in group-operated switches. It has high-pressure silver-to-copper contacts; a new hard-drawn copper tubular blade; a new blade pryout and lock for smooth, positive operation. It is available in all standard ratings from 7.5 to 161 kv and in ratings of 600 and 1,200 amp, for upright, inverted or vertical mounting

Servel goes electric with NICHROME*



Servel's latest model refrigerator retains all the features of "silent" operation, using no moving parts; but the gas flame has been replaced by an electric heating unit of Nichrome containing two resistance wires. One of these operates constantly, and maintains normal refrigeration; the other operates intermittently, by thermostatic control, and supplies the additional heat required when extra refrigeration is necessary.

Now the famous silent Servel refrigerator operates on electricity. In the new refrigerator, a simple electric heating element provides heat for operating this absorption-type system. Just plug it in, and the new Servel goes to work . . . provides the *soundless* performance for which it is famous.

Since cold is obtained without a single moving part by means of heat applied to the system, the small heating element is the vital part of the new Servel. Every operation of the refrigeration cycle, indeed, depends upon the heater unit *staying on the job.*

Because of this, Servel has adopted heating elements made with Nichrome—the electrical resistance alloy that is the very heart of quality appliances everywhere. Remarkably resistant to high heat and corrosion, and able to retain its physical and electrical properties despite thermal shock resulting from intermittent operation day in and day out, Nichrome assures Servel of efficient operation and a lifetime of dependable service.

Whatever *your* requirements for electrical resistance material, it will profit you to consult with us. In addition to world-famous Nichrome and Nichrome V, we produce over 80 alloys to meet the varied needs of the electrical and electronic fields. Although strategic materials and the alloys we make from them are on strict allocation at the present time, we'll be pleased to serve you to the best of our ability.

Driver-Harris Company

Western Representative: **ANGUS-CAMPBELL, INC.**

1114 Valencia St., San Francisco 449 So. San Pedro St., Los Angeles

Main Office and Plant: HARRISON, NEW JERSEY

* T. M. REG. U. S. PAT. OFF.

MAKERS OF THE MOST COMPLETE LINE OF ELECTRIC HEATING, RESISTANCE, AND ELECTRONIC ALLOYS IN THE WORLD

A few years back, all switch and bus units were made with a short second shell which invited the possibility of cascading in stacks. That is, up until Pinco introduced the revolutionary new L 735 switch and bus stacking unit. With rugged porcelain, a larger second shell and an improved center design, this new unit showed far superior flashover performance and greatly reduced the tendency to cascade. It also provided added leakage protection and increased mechanical strength.

Today, this idea like many others pioneered by Pinco, is an accepted industry standard . . . further evidence that Pinco is constantly primed to keep abreast of industry requirements. So whether your insulator requirements are ordinary or extraordinary—the services of the entire Pinco organization are yours to command.

See Page 118 Pinco Catalog No. 49
for complete electrical and mechanical specifications.

The Porcelain Insulator Corporation
769 Main St., Lima, N. Y.

Warehoused and Distributed by JOSLYN PACIFIC CO.
2424 FIRST AVENUE SOUTH.....SEATTLE 4, WASHINGTON
100 POTRERO AVENUE.....SAN FRANCISCO 3, CALIFORNIA
1333 N. W. KEARNEY STREET.....PORTLAND 9, OREGON
5100 DISTRICT BOULEVARD.....LOS ANGELES 11, CALIFORNIA

PINCO INSULATORS

Suspension Insulators . . . Switch and Bus Insulators . . . Distribution Clamps . . . Distribution Pin Types and Guy Strains . . . Transmission Line Fittings . . . Tree Insulators . . . Transformer and Circuit Breaker Bushings . . . One Piece and Multi-part High Voltage Pin Types . . . Suspension and Strain Clamps . . . Indoor Bus Support Porcelain . . . Lightning Arrester Porcelain.

Spring Clamp

(10) Hubbard & Co., 6305 Butler St., Pittsburgh, Pa.

The ServiSleev is a spring clamp designed to hold the loose end of the guy strand firmly to the guy. It is said to eliminate time-consuming methods of wrapping with a separate piece of wire or tape or with the strands of the loose end. The device is made of heavy galvanized steel, with a belled end. It is slipped over the guy with the belled end toward the clamp. According to the manufacturer, it slips easily over the loose end of the strand and is tapped into position with any convenient tool. The installation is said to take only four or five seconds and to give a neat job with permanent protection.

Redesigned Insulation Tester

(11) General Electric Co., Schenectady 5, N. Y.

A redesigned 10-kv winding tester for detecting insulation faults and winding dissymmetries in motors, generators and coils has four instead of seven tubes and uses a smaller thyratron, without reduction in performance, the manufacturer states. A selenium rectifier replaces the tube rectifiers in the cathode tube excitation circuit.

The tester consists of a repeating-type surge voltage generator, a cathode-ray oscillograph and a synchronously driven switch for alternately reversing the direction of surge travel through the winding. The equipment is contained in one cabinet. It has a surge generator capacitance of .05 mf, a voltage of 0.2 to 10 kv (adjustable in 2% steps) and a current capacity of 100 amp. Motors as large as 2,000 hp, 2,300 v may be given an adequate coil-to-coil and turn-to-turn test and the device may be applied also to miscellaneous small- and medium-sized coils and d-c armatures up to 20 hp, 220 v, it is claimed. Publication GEC-321 gives details.

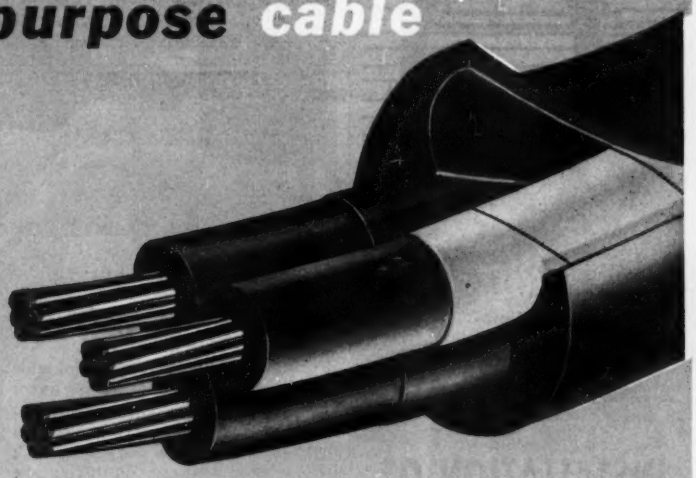
(12) **SHOVEL**—The Hydrohoe, hydraulic truck-mounted dragshovel for conduit trenching and special excavating, features two separate digging actions; precision control; hydraulic ejector on dipper; buckets without bails, sheave blocks or drag ropes to interfere with loading; rapid conversion to clamshell or crane in the field. Made by Bucyrus-Erie Co., South Milwaukee, Wis.

For More Data
Fill in Coupon, Page 52

Durasheath

the ***all-purpose*** *cable*

for both
power
and light
services



Durasheath's* tough neoprene jacket stubbornly resists electrolysis, corrosion, temperature extremes, cutting, abrasion, impact, flame, oil, grease, moisture and most soil acids and alkalies.

Run it overhead, in ducts, or buried underground—or all three in one continuous run.

It's flexible, easy to handle, economical to install; made in single or multi-conductor construction.

Your Anaconda representative can show you why it's good business to install this versatile, all-purpose cable. Just ask him.
Anaconda Wire & Cable Company, 25 Broadway,
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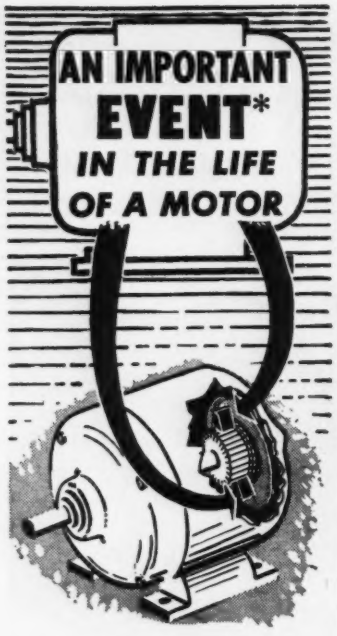
the right cable for the job

ANACONDA® **WIRE AND CABLE**



*
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GOOD
BRUSHES

Quoting Napoleon's theory "An Army Travels on Its Stomach" we prefer a theory that has been proven by the performance of the motors in your plant:—"motors and generators perform efficiently in proportion to the quality of their brushes." Look to OHIO for efficient operation and write to us for our catalog in your category:—Industrial, General Purpose, Mining, Welding, Appliances.

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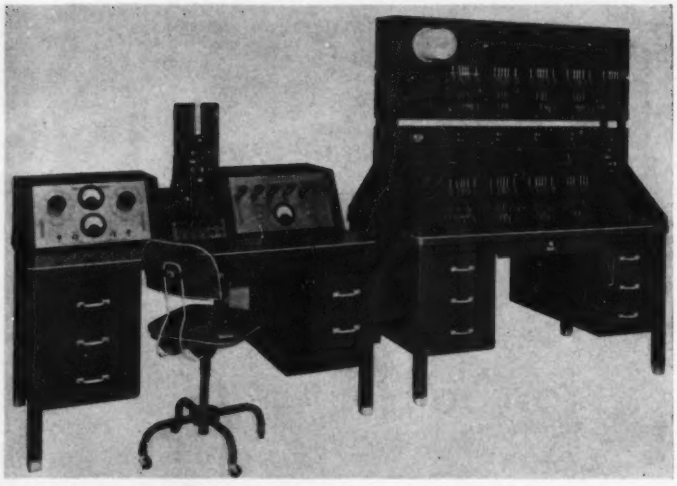


Control and Rack Table

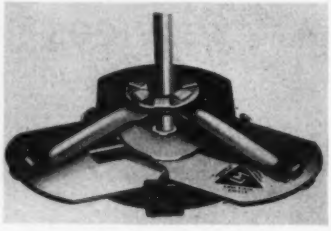
(13) The States Co., 3 New Park Ave., Hartford, Conn.

A thermal demand meter control table (form FDM) and accompanying meter rack table (form FDMR) are designed so that the number of demand meters that may be tested on the rack table is dependent only on the current capacity desired. The regulators have a capacity of 2.4 kva when connected single phase to 240 v. Two regulators are located on the control table, one for loading and one for phasing. The loading regulator is connected to the moving point of the phasing regulator. When a varying number of meters is tested in series, the secondary current of a loading transformer changes its phase relation with respect to the primary voltage. Thus various power factors on the test rack would result for various groupings of meters.

However, by using the two regulators of the control table, it is possible to bring the current potential into unity power factor for any quantity or capacity of the meters under test. The loading regulator permits adjustment from zero primary voltage on the loading transformer up to the full voltage of the source.

According to the manufacturer, all controls are in easy reach of the operator; it is possible to utilize part of the rack for heat runs under potential while the remainder is being used for test purposes; the phasing and loading regulators provide immediate control of varying conditions.

(14) **STRIPPER** — A heavy-duty automatic wire stripper made by Wood Specialty Mfg. Co. of Rockford, Ill., features a delayed-action release to prevent the wires from being crushed or bent. Squeezing the handle causes the stripper to grip the wire, cut the insulation and strip it free. It strips solid and stranded wire from 8 to 22 gage and, by changing blades, can be used for parallel wire, 300 ohm TV and FM twin-transmission wire.



Expanding Anchor Redesigned

(15) Line Material Co., Milwaukee 1, Wis.

Increased holding power is an improvement in this redesigned expanding anchor. Larger sliding plates are claimed to have an expanded area 10 to 15% greater than the old design. Tamping to the expanded position has been made easier by a new hinge arrangement at the point where the spreader arm attaches to the sliding plate, a feature that prevents binding. The spreader arm is heavier and stronger; will not bend or distort when the anchor is tamped to the expanded position, it is stated. The new design is being used for the manufacturer's complete line of two-, three- and four-way anchors.

(16) **LIGHT**—The Jones Metal Products Co., West Lafayette, Ohio, has a new all-purpose Jiffylite. It will fit any standard socket and was designed for laundry room, garage, attic, stairway, etc.

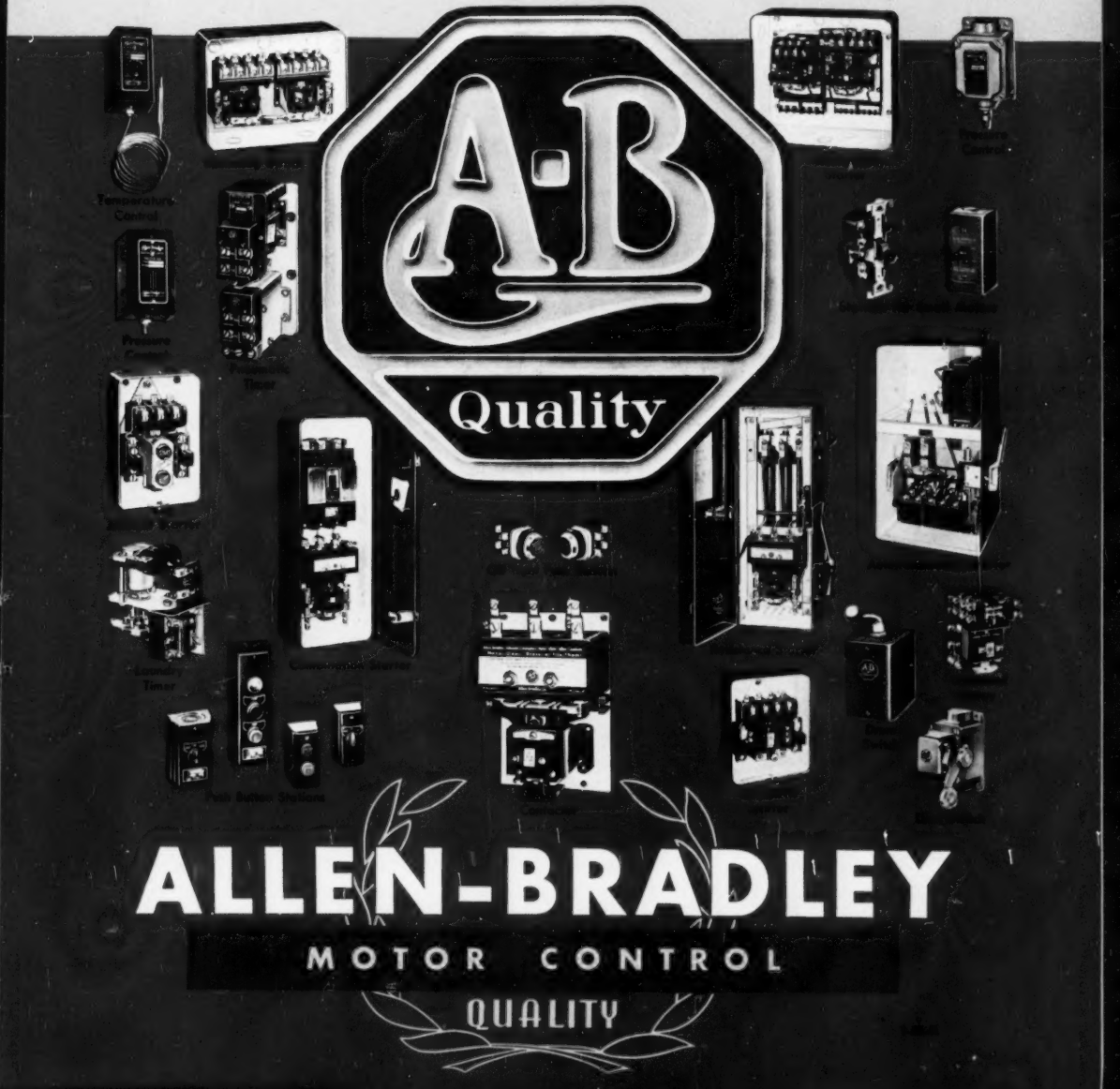
YOU STANDARDIZE on

THIS QUALITY LINE OF MOTOR CONTROLS

This complete line of trouble free motor controls . . . with manual and automatic starters and accessories in a wide range of enclosures . . . is popular with plant engineers, maintenance men, and electrical contractors.

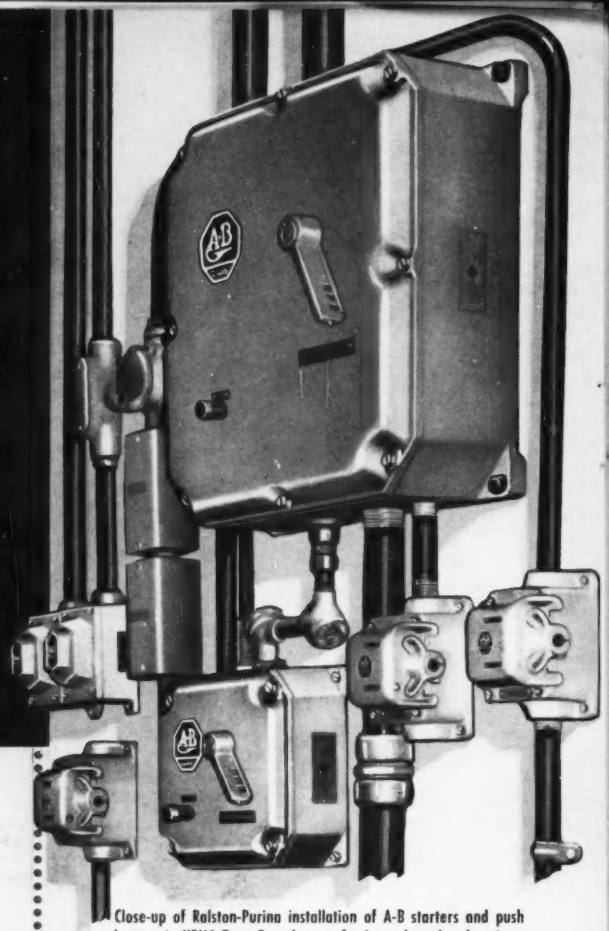
You can find in the new 92-page A-B Handy Catalog the right combination of control units to satisfy any operating requirement. This illustrated reference on manual and automatic solenoid motor controls is yours for the asking.

Allen-Bradley Co. • 1316 S. Second St., Milwaukee 4, Wis.



ENCLOSURES are IMPORTANT

Avoid COSTLY maintenance by using the right enclosure for every job



Close-up of Ralston-Purina installation of A-B starters and push buttons in NEMA Type 9 enclosures for hazardous dust locations.

It pays out . . . in lower maintenance, fewer shutdowns, and greater production . . . to use the correct enclosure for each motor starter.

Some installations need waterproof or weatherproof enclosures. Others require cast iron cabinets to prevent explosions in dusty atmospheres. For bad corrosive conditions, oil immersed starters may be essential. Of course, for normal applications, the general purpose pressed steel enclosure with bonderized and black enameled finish is popular.

You can always find the right enclosure in the Allen-Bradley line to protect your plant, personnel, and production schedules.

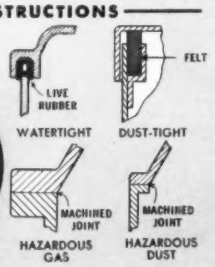
Allen-Bradley Co. 1316 S. Second St., Milwaukee 4, Wis.

1-52-MR

THERE IS A STANDARD ENCLOSURE FOR EVERY TYPE OF INDUSTRIAL SERVICE

TYPICAL CONSTRUCTIONS

Sectional Views of Cover Seals



ALLEN-BRADLEY

TROUBLE FREE MOTOR CONTROLS

Plastic Tape

(17) Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn.

A heavy-duty plastic electrical tape, No. 21, is for applications where more-than-average technical strength is needed, according to the manufacturer, who recommends it for anti-corrosion protection for pipes, cables and equipment laid underground where resistance to abrasion is important. It is also designed for protecting and insulating cable and high-tension leads subject to wear, abrasion and rough handling and for bus bars carrying high voltage.

The tape has a black vinyl plastic backing that is 20 mils thick. It has a dielectric strength of 22,500 v, an insulation resistance of 200,000 meg-ohms and an electrolytic corrosion factor of 1.0. It comes in 36-yd rolls ranging in widths from ¾ to 16 in.

Fusible Panelboard

(18) Kolton Electric Mfg. Co., 123 New Jersey Railroad Ave., Newark 5, N. J.

Narro-Unit panels are announced by the manufacturer as a low-cost fusible panelboard designed for use where space is limited. Where width is a factor, single-row construction is suggested, using either the switch and fuse NTPR or the plug fuse only NPR panel. These panels are 13 in. wide; have 4-in. gutters.

They are adapted to special circuit requirements by use of six combinations of single-pole and double-pole tumbler switches and plug fuse only blocks. Switches are rated 30 amp at 125 v. No tools are required to remove front or panel.

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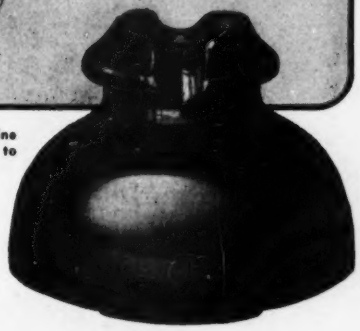
Installed in 1928
STILL GOING STRONG
"Long Life" Illinois Porcelain Insulators which will provide dependable service for many years to come.

Right: Illinois Pin Type Distribution Line Insulator—one of many styles to meet all requirements.

Below: Typical Illinois Suspension Type Dead End Insulator.



● All Illinois Porcelain Insulators are designed and produced to exacting electrical and mechanical standards — completely tested and inspected to insure against breakdown on the job. This, plus a proved record in countless installations like the one shown above are your assurance of long years of thoroughly dependable service.

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ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS

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You get single-phase ML32 for same price as 8-step unit. And look at these features!

- **±10% regulation.** 20% range of regulation in thirty-two 5/8% steps.
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GENERAL ELECTRIC

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With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

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2400/120/240

450 KVA, Type F Unit Substation, 4160 V. Delta, 60 Cycles, 3 Ø—120/208Y, 4 wire.

Made by a pioneer in the dry type, air-cooled transformer field. Eliminate need for liquid filled units. No hazardous, inflammable oil or toxic liquid to fuss with. Maintenance of oil level, foreign matter, sludge accumulation, and subsequent filtering are relegated to the "horse and buggy days".

MARCUS DRY TYPE, AIR-COOLED TRANSFORMERS

ARE SAFE — No explosion or fire hazards. No fire proof vaults. Class B and C heat proof insulations.

ARE ECONOMICAL — Lower cost installation and operation, negligible maintenance.

For the transformer that's second to none, specify MARCUS.

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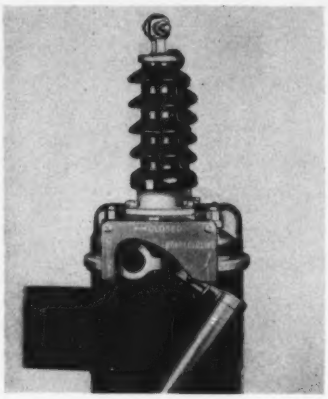
PIONEERS IN THE FIELD OF AIR-COOLED TRANSFORMERS



Reclosing Attachment

(19) Kyle Products Division, Line Material Co., South Milwaukee, Wis.

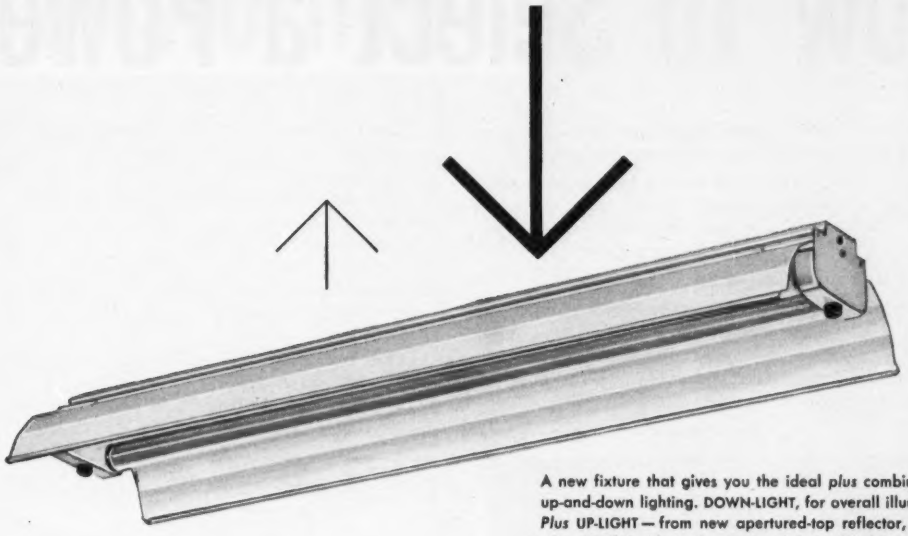
This nonautomatic reclosing attachment for the entire line of Kyle-type oil circuit reclosers is manually controlled by means of a lever located under the sleet hood. It cuts out the automatic reclosing of a recloser in service. According to the manufacturer, this safety feature gives the same protection as is found on substation breakers and the lineman who has to work lines hot is guarded because the unit will not reclose after the first operation. The attachment is optional and is installed at the factory at a slight additional cost.

Motor

(20) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

A heavy duty, mill-type, flange-mounted down-coiler motor is for operation under severe conditions. It has a heavily reinforced flange mounting; heavy-duty, double-row ball bearings; heavy cast brass mill-type brushholders. Construction is totally enclosed, with leads brought out through packing glands and protected by heavy hose. Relatively small diameter requires minimum mounting space. Flanges are available for mounting on any type of down-coiler.

(21) **WEED KILLER** — A nonselective chemical weed killer developed by DuPont is claimed to eradicate dense growths of mixed grasses and broadleaf weeds, leaving bare soil. Known as CMU, for 3-(p-chlorophenyl)-1, 1-dimethylurea, the chemical has been tested under various field conditions and in every state. It is claimed to be nonflammable and noncorrosive and relatively nonvolatile. During 1952 a limited amount will be available for commercial use. It will be made by DuPont's Grasselli Chemicals Dept., Cleveland, Ohio.

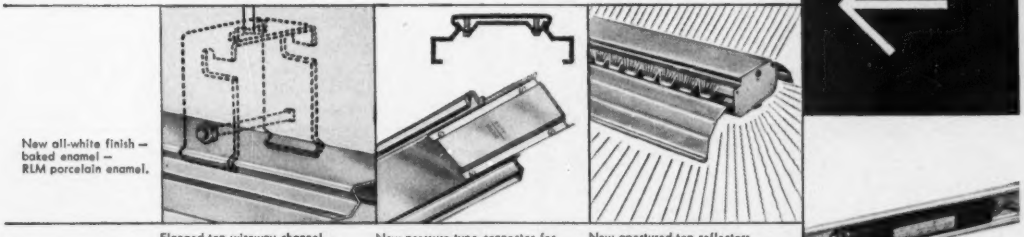


A new fixture that gives you the ideal *plus* combination of up-and-down lighting. DOWN-LIGHT, for overall illumination. *Plus* UP-LIGHT — from new apertured-top reflector, new all-white finish inside and out — to minimize brightness contrast (and give sufficient light for overhead maintenance). Result — a new high standard of illumination that enables workers to see easily and work better.

A more compact fixture, too, made possible by the use of the new G. E. small cross-section ballast. Long life assured by rigid adherence to the Miller 8-Point QUALITY standard. Engineered for easy installation and maintenance. Carries RLM label. Can be mounted individually or in continuous rows. Delivery — excellent.

a new plus in industrial lighting

miller *50 FOOT CANDLER JR.*



New all-white finish — baked enamel — RLM porcelain enamel.

Flanged-top wireway channel permits clamp hanger mounting anywhere along entire length — simplifies installation.

New pressure-type connector for joining luminaries for continuous rows. No holes to drill.

New apertured-top reflectors, minimize brightness contrast — give sufficient up-light for overhead maintenance.

New small cross-section G.E. #89G343 ballast — streamlined wireway.

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How To Select a Power

HOW DO YOU KNOW the transformer you select will give you most performance per dollar over the longest time?

Transformers are pretty well standardized in appearance, ratings and original specifications. Some people may even think they *are* the same. But based upon ability to stand up in service, it's amazing how transformers differ.

Just look at the corona-free design, for example.

In the corona-free transformer designers eliminated corona* at the maximum test levels. Transformers like these retain full impulse strength even after repeated lightning and switching surges. They stay young. They're built to last years longer and *do*.

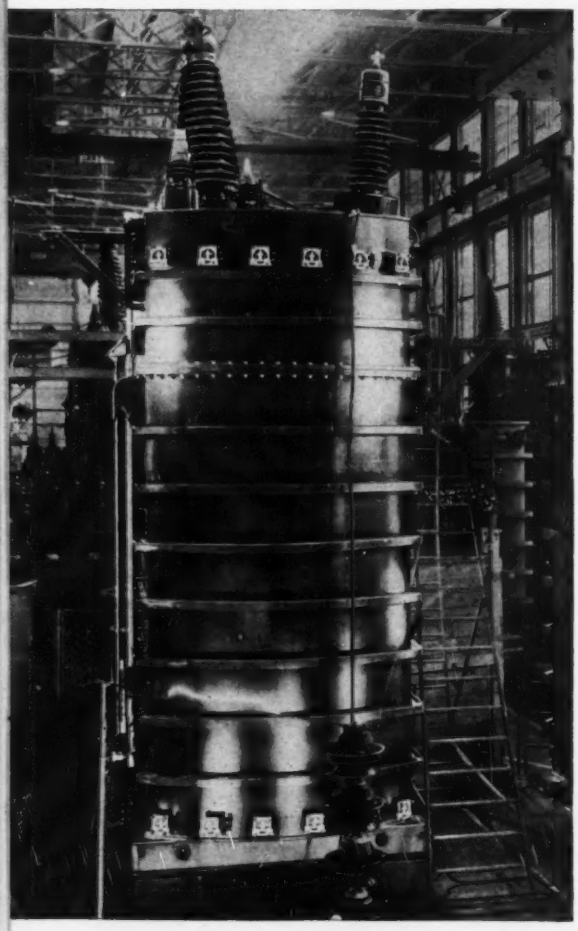
Corona-free design at Allis-Chalmers is the result of 19 years of research and testing — when lightning first became a recognized factor. Through use of calculating boards, powerful surge generators and oscillograms, engineers were able to detect the slightest trace of corona during impulse tests and take steps to eliminate it.

They put in close-fitting insulation around coils and conductors, eliminated voids, diffused dielectric flux so that each part of the winding was corona-free at maximum test conditions.

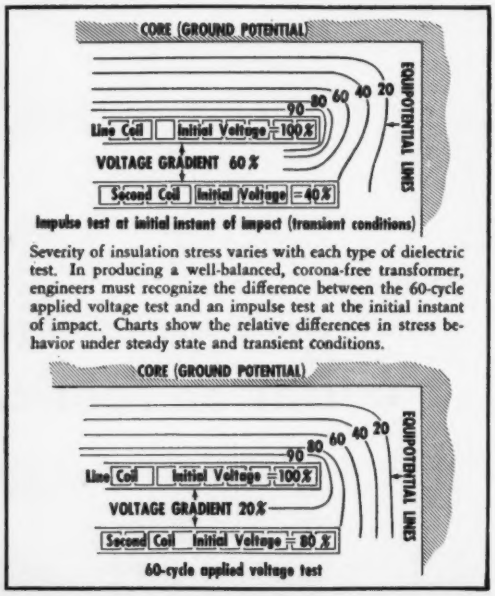
Failure-free operation of these power transformers means long lasting performance . . . more performance for each dollar invested. Allis-Chalmers, Milwaukee 1, Wisconsin.

A-3489

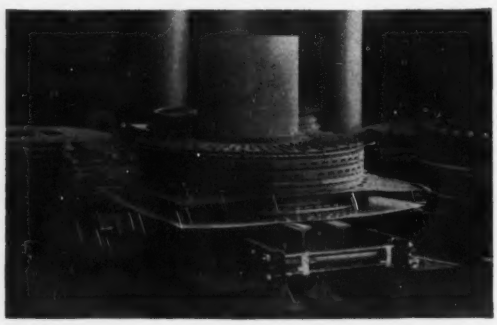
*Corona is a dielectric discharge that scores insulation and destroys impulse strength.



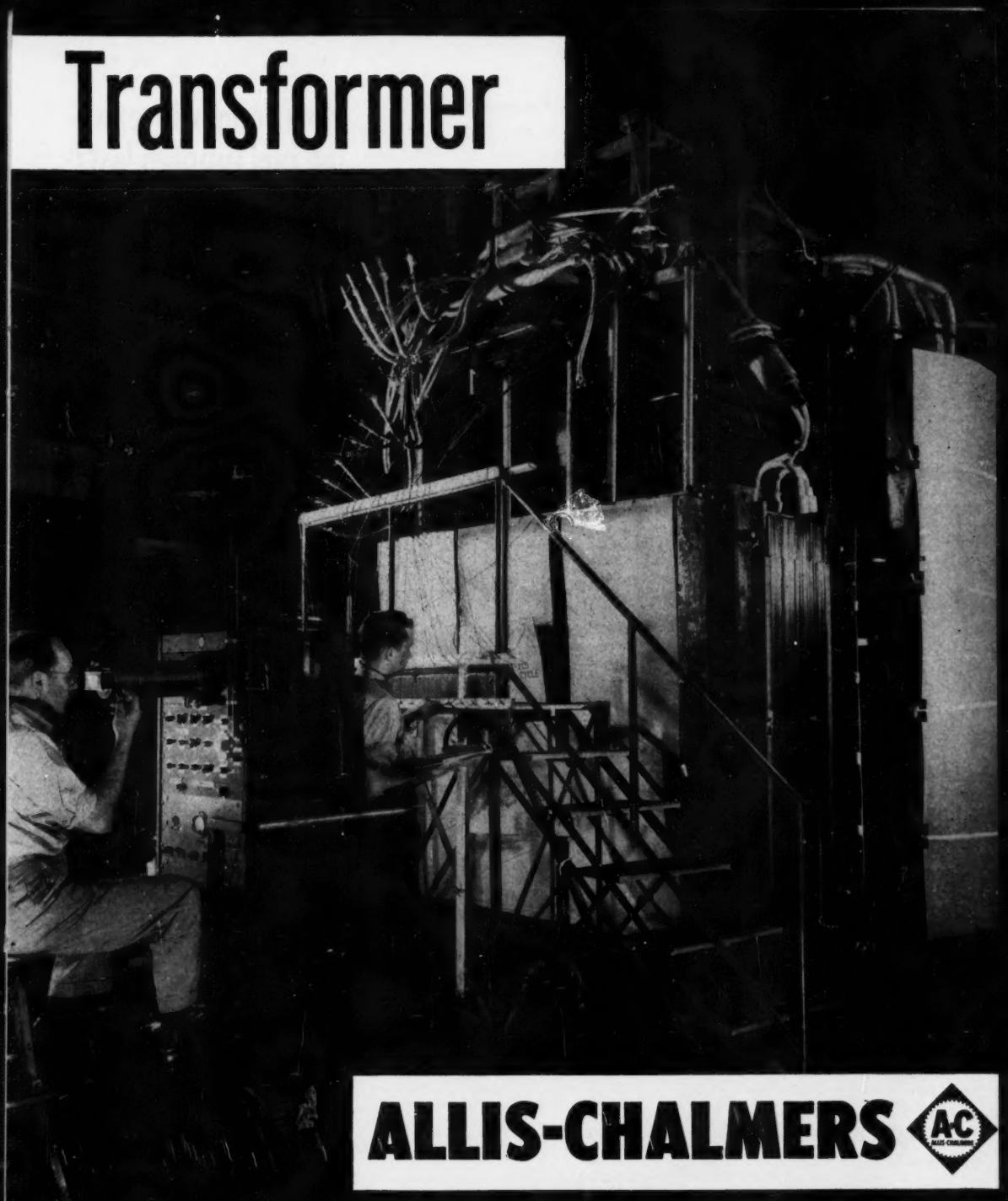
An AIEE chopped wave test at 1,035,000 volts for this 35,000 kva autotransformer is one of its last performance checks before shipment. New equipment and streamlined testing procedures have cut testing time from weeks to hours.



Severity of insulation stress varies with each type of dielectric test. In producing a well-balanced, corona-free transformer, engineers must recognize the difference between the 60-cycle applied voltage test and an impulse test at the initial instant of impact. Charts show the relative differences in stress behavior under steady state and transient conditions.



Form-fitted insulation you see on this 30,000 kva forced oil-cooled transformer will reduce the effects of concentrated dielectric fields. By placing insulation next to areas of dielectric stress and by rounding insulation surfaces, dielectric stress is reduced.



This 50,000/66,667 kva transformer for a Texas utility is getting a voltage distribution test before its final full-voltage impulse test. Such a design check tells whether the assembled transformer will react properly under maximum impulse voltage stresses.

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GREENLEE

Other GREENLEE timesaving tools for electrical work: Hand Benders; Joint Borers; Cable Pullers; Knockout Tools; Auger Bits and Drills.

Electronic Counter

(22) Hewlett-Packard Co., 395 Page Mill Road, Palo Alto, Calif.

Model 524A frequency counter is a single-unit device capable of instantly measuring and displaying low, medium and higher frequencies up to 10,000,000 cycles per second. According to the manufacturer, the exact frequency of each unknown measured is presented directly on the instrument's front panel and no interpolation is required. Equipment may be used by nontechnical personnel.

For determining frequencies above 300 cycles per second, it is necessary only to connect the unknown to the instrument. A front panel switch selects five different counting periods; the instrument counts the frequency cycles occurring during the time interval selected and displays the frequency numerically for an equal length of time. When switched to automatic operation, this cycle of counting and display is repeated indefinitely. By pressing the manual button, the count may be held any desired length of time.

For low-frequency work the instrument measures the period of duration of a cycle in microseconds. A 10-cycle sample is taken and the duration of a cycle is then presented directly in microseconds. As in direct-frequency counting, these duration measurements progress automatically through equal measuring and display periods; or readings can be held on the panel.

(23) RUNWAY LIGHT—A medium-intensity runway light, type LD, is for use as day and night marker of noninstrument runways, landing strips and taxiways of all classes of airports. It is available in three general types of mounting assemblies: base mounted, column mounted for separate burial transformer; column mounted for integral mounting transformer. The lamp has two V-notches in the body casting to permit daytime alignment of the fixture. Made by Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

(24) CONTROL—The Heet-O-Matic day and night thermostat control is a combination timer-heater powered by a Telechron fractional horsepower motor, operating on 110 v a-c, 60 cycles. It is for thermostats regulating domestic stoker-fed, gas and oil heating systems. Made by Automatic Controls Corp., Ann Arbor, Mich.

To receive manufacturers' bulletins with additional information on these products, fill in coupon on page 52.

How long will existing fuel supplies last?

—and what can be done against the day they are exhausted?

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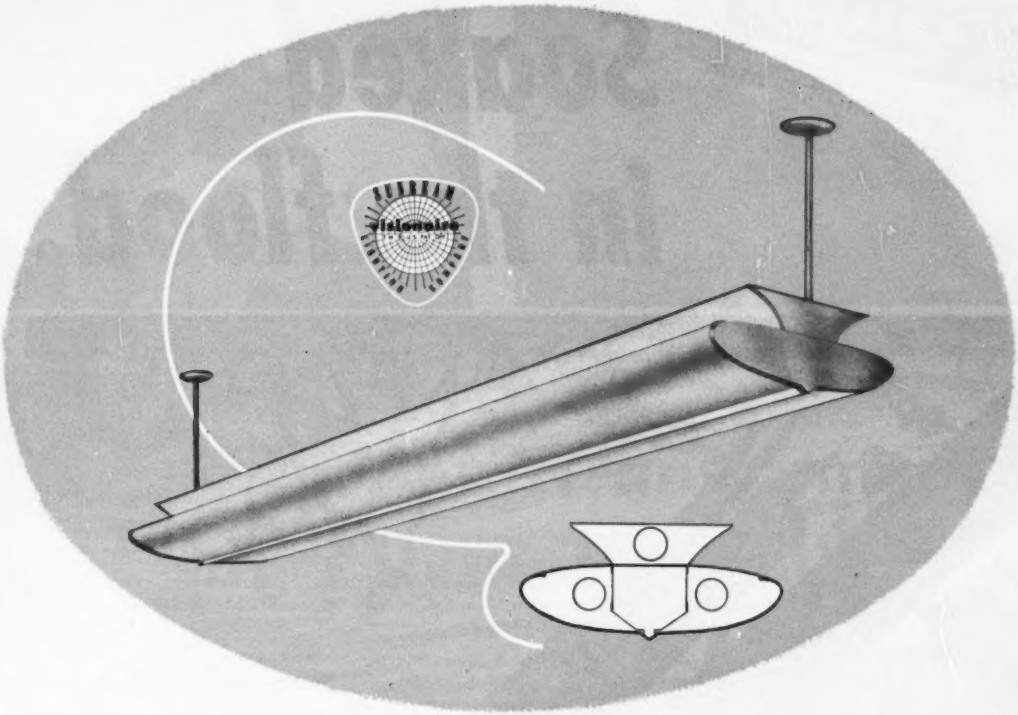


MAXIMUM VISUAL EFFICIENCY PER FOOT CANDLE

Here is another Sunbeam visionaire that leads the country in luminaire design and photometric characteristics. Its unique 3-lamp configuration is designed to produce a uniform (no "hot spots") and wide-spread distribution of indirect light combined with the low brightness transmission of the extruded plastic side panels. Ceiling-fixture contrast ratio is markedly reduced and the general indirect illumination contributes to greater visual comfort. For modern offices and areas where speed and efficiency of work is critical, this is the lighting unit to specify. The easily removed, single piece plastic side panels are supported by metal rails and grooves. Pendant mounted only, this luminous-indirect P1270 series is available in 48" and 96" lamp lengths, fluorescent and slimline.

SUNBEAM LIGHTING COMPANY
777 EAST 14TH PLACE
LOS ANGELES 21, CALIF.

SPIRAKORE TRANSFORMERS

GIVE EXTRA YEARS OF SERVICE

Soaked in the flood...

"We cleaned and tested the first few of the newer transformers," said city engineer, Harvey Earp, "and found that no water had gotten in, . . .

"so we just hosed down the remaining Nitrile-sealed transformers, gave them a routine check, and put them back on the lines."

G-E Spirakore* Transformers stay moisture proof!

When the flood hit the city of Osawatomie, Kansas, it completely submerged a number of distribution transformers. Yet service was restored in most areas only a few hours after the water receded.

This speed was possible because of the fine work done by the repair crews . . . *and the water-tight seal on G-E Spirakore transformers.* Although water did leak into some transformers of older design, every one of the Nitrile-sealed Spirakore transformers came through unharmed. The first Nitrile-sealed transformers recovered were cleaned and found undamaged—so the rest were merely washed with a hose, given a routine inspection, and put back in service without an inside tank check. And they are still on the job!

Nitrile Gaskets Used in Every Opening! Not even flood waters could get into Spirakore transformers because every opening—for cover, hand-hole and bushings—gets sealed with a Nitrile gasket. Completely air-tight, water-tight, this sealing eliminates transformer breathing—prolongs the life of both oil and insulation. Because no cement or sticker is used, gaskets can be removed easily—are reusable.

Better sealing is just one of the design features that make Spirakore the finest transformer obtainable. Bulletin GEA-5400 describes many more. If you haven't a copy, write for one today. Address *General Electric Co., Schenectady 5, N. Y.*

Reg. Trade-mark of General Electric Co.

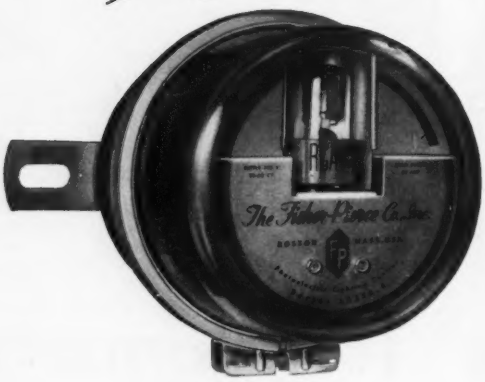
"The Nitrile seal," continued the city engineer, "kept our Spirakore transformers air-tight and helped us get our system back in service just a few hours later."

402-117

GENERAL ELECTRIC

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

Improved....



Series 63300 B

FISHER-PIERCE

PHOTOELECTRIC CONTROL

FOR STREET LIGHTING

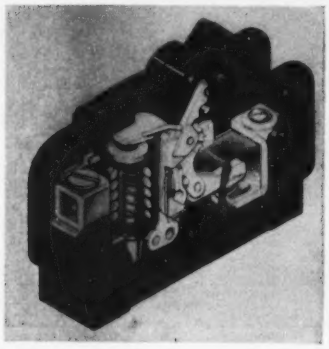
This new Fisher-Pierce Control is the result of long experience in design and manufacture, combined with practical experience of more than 600 electric utilities in more than 20,000 installations.

The new 63300 B Control is mechanically and electrically interchangeable with existing controls. The same dependable Fisher-Pierce circuit, consistently giving tube life of more than 20,000 hours, has been retained. Improved spacing and insulation provides increased protection against lightning damage . . . up to 2500 volts rms Hipot. Mechanical design has been altered to provide maximum simplicity for greater economy of servicing.

New Address

The FISHER-PIERCE Co., Inc.

43 PEARL STREET, SOUTH BRAINTREE, BOSTON 85, MASS.



Circuit Breaker

(25) Heinemann Electric Co., Trenton 2, N. J.

A newly designed Magnette panelboard circuit breaker is interchangeable with many other conventional breakers, the manufacturer announces. Although more compact, the new design employs the fully magnetic operating principle. Since it has no thermal elements, its rating is not affected by room or internal panelboard temperature. Tripping is effected only by the current itself. On simple overloads, the breaker provides for a time delay, but at ten times the rated current or short-circuit conditions it trips instantly.

Arc extinction is provided by a quenching well. Principle application, according to the manufacturer, is in panelboards handling lighting and appliance circuits and as a built-in combination start-stop switch and overload protector for electrical equipment. It is available in single-pole units, 120 v a-c (15 to 60 amp) or two-pole units, 120/240 v a-c (15 to 35 amp). Underwriters' approved. Additional information in bulletin 3101.

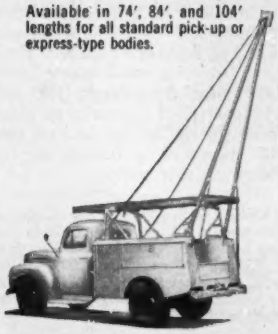
(26) WALL PLATES—New Uniline wall plates offered by Pass & Seymour Inc., Syracuse 9, N. Y., come in brown or ivory plastic for use with all P&S and P&S-Despard wiring devices, single and multigang. Catalog numbers are the same, 91000 and 92000 series.

(27) COUNTER—Model 243 dual predetermined counter made by Potter Instrument Co., Great Neck, N. Y., will continuously recycle, accepting counts up to 1,000 per second and reset instantaneously after each output operation without missing a count, the manufacturer states. The output relay action may be momentary, adjustable over the range from 0.01 to 0.1 second, or SPDT stay-put, alternating positions as each predetermined count is reached. By dial switch settings, any two numbers from 1 to 9,999 may be chosen as counting points at which control actuation is to occur.

LINE CONSTRUCTION BODY (600C)
This workhorse of the utility industry can be furnished in lengths from 9' to 14' for any type of utility construction work.

REVOLVING AERIAL LADDER
Models available in working heights of 23' 6", 26' 6", 30' 6", and 32' 6" for all styles of bodies.

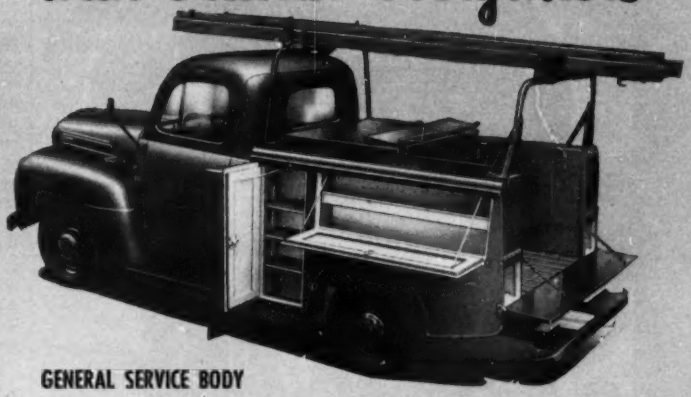
COMPARTMENT SECTIONS
Available in 74', 84', and 104' lengths for all standard pick-up or express-type bodies.



LIGHT DUTY MAINTENANCE BODY (350)
This compact unit is widely used for service and light duty construction. Fold-over derrick can handle 40' poles.

There are many styles of *Powers-American* Bodies not shown here. Write for descriptive catalog today.

"The Accepted Standard with Utilities Everywhere"



GENERAL SERVICE BODY
Available in a wide range of body styles to fit operating requirements in all phases of the utility industry. Models can be furnished for ½, ¾, 1, and 1½ ton chassis. Compartments can be equipped with shelves, bins, and accessories to suit individual needs.

The 1 Source
for all types of utility bodies and equipment!

There's no need to look further than *Powers-American* to solve all your utility body and equipment needs. Whether the job calls for a small service body for repair work, a line body for large construction jobs, or special equipment such as towers or ladders, *Powers-American* is *your* answer.

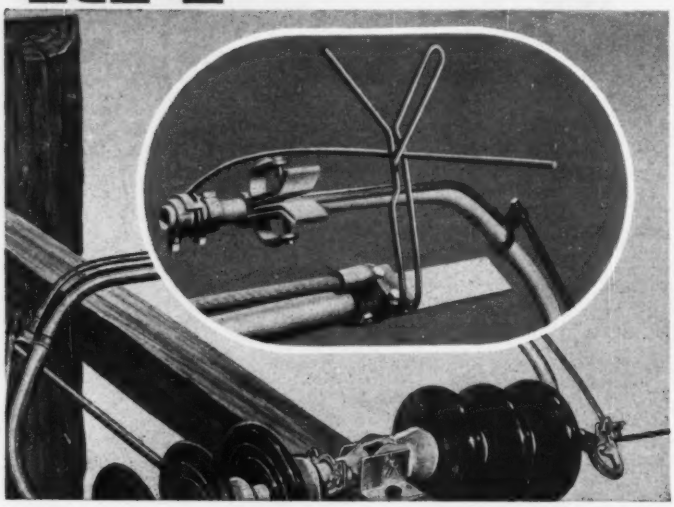
Leadership in construction, maintenance and service work in all phases of the public utility industry guarantees long life and trouble-free service. Write today for more information.

POWERS *American* DIVISION

PUBLIC UTILITY BODIES AND EQUIPMENT

McCABE-POWERS AUTO BODY COMPANY
432 Fifth Street, Oakland 7, California

KPF POLE TOP SWITCHES



Drop 40 miles of 69 kv lines with KPF Quick-Break pole top switch

Operating engineers tell us KPF switches with Quick-Break attachment are the most outstanding air-break switch improvement in 25 years. Before development of this Quick-Break device, pole top switching of 69 kv circuits was limited to some 6 miles of line. Now, operating experience shows that 40 miles of 69 kv line can safely be dropped with this equipment.

The secret of the KPF Quick-Break is a heavy-duty cat's whisker which whips free in a split second as the switch is opened. This mechanism prevents establishment of an arc; thus critical arc length is no problem.

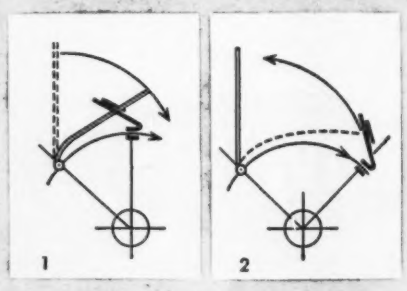
The KPF Quick-Break attachment is simply and ruggedly constructed for low cost, long life and all-weather dependability. It is available for all KPF switches rated 15 to 69 kv.

HERE'S HOW KPF QUICK-BREAK WORKS

1. Spring rod winds to full tension as switch opens.

2. Rod springs clear, breaking contact at high speed.

Write for details of KPF Quick-Break attachment and low cost, long-lasting, easy-to-install KPF Switches.



KPF ELECTRIC COMPANY
1624 E. Alpine Avenue • Stockton, California

Telemetering Equipment

(28) Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

Faster telemetering response (less than 0.3 second exclusive of end devices) is claimed for the new millivolt-input Freq-O-Tron equipment. It is designed to give remote metering of any quantity that can be converted to a proportional millivolt quantity and will transmit any value by use of either a microwave, power line carrier or pilot wire medium. Flexibility of operation is said to permit totalization of similar quantities at either the measuring, intermediate or receiving stations.

The equipment consists of a new-type IT-1 transmitter and IR-1 receiver and is calibrated to the individual customer's requirements. It can be supplied as a complete installation, including carrier or microwave communication systems.

Air Conditioner

(29) Frigidaire Division of General Motors, Dayton 1, Ohio.

A 7½-ton capacity self-contained air conditioner has been announced for such installations as average-size retail stores and general offices. The new unit has the same styling as the 3- and 5-ton models and is 40 in. wide, 28 in. deep and 86⅜ in. high; is finished in two-tone gray. It delivers 2,700 cu. ft. per minute of conditioned air and has an air throw of 75 ft.

The mechanism is located within the cabinet. Only electrical, water and drain connections are required. Controls are behind a small access panel on the front of the cabinet. The unit may be controlled manually or automatically. It may be installed remotely with ductwork to furnish air for several rooms.

(30) **STARTERS**—NEMA size 0 and 1 manual motor starters with built-in indicating lights are available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa. They are mounted in NEMA type 1 enclosures and designated as class 10-100-S1 and 10-100SOA.

(31) **GEL-TIME METER**—A meter designed to measure the time required for fluid thermosetting compositions to reach a point of rapid viscosity change during polymerization has been announced by General Electric's Special Products Division, Schenectady 5, N. Y.

For More Data Fill in Coupon, Page 52

NOW! Get immediate delivery on lighting panels up to 42 circuits from your supplier's stocks

Another great forward step by BullDog to simplify ordering, stocking and use of electrical equipment

The basic device principle has now been extended to all Pushmatic Electri-Center lighting panelboards up to 42 circuits.

BullDog Electri-Center Panelboards are now available from local stocks. Just choose the basic device that fits your circuit requirements . . . select the additional Pushmatic unit you need at the time . . . and get a complete panelboard right over the counter. A flexible panelboard, that lets you *add extra circuits later,* when needed.

Now, no more special ordering and long waits when you need panelboards in a hurry. You get immediate delivery on a top-quality item that was once custom-made. You get savings, because these BullDog panelboards are now mass-produced, and cost less. Only 5 panels replace hundreds of catalog numbers, cover all your needs up to 42 circuits . . . make ordering and stocking easier.

Ask your local supplier for Bulldog Pushmatic Electri-Center Panelboards.

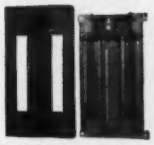
BULLDOG
Pushmatic Electri-Center Panelboards

- For plants, commercial buildings, institutions.
- Underwriters'-approved up to 42 circuits.
- Meets Federal specifications WP 131a Class A.
- Push-button switching and automatic circuit protection. No reset position.
- Individual Pushmatic units (Thermal Magnetic) rated 15, 20, 30, 40 and 50 Amps; quick-mounting, fully interchangeable.
- Code Gauge steel fronts, flush or surface type.
- Code Gauge steel boxes with ample knockouts in removable ends.
- 4"-wide gutters for easy wiring.
- Provisions for Main Lugs at top or bottom.
- Flexible from every standpoint.

Write for Descriptive Bulletin No. 513

Now from your supplier's stocks . . . 5 boxes . . . 5 fronts . . . 5 interiors . . . plus Pushmatic units . . . eliminate hundreds of confusing catalog numbers and let you get immediate delivery on these two complete BullDog panelboard lines.

Boxes: 26", 32" and 38" high. All 20" wide; 5½" deep. Ample knockouts.



Basic Device principle. Four Pushmatic circuit breakers and fillers supplied with the two single-phase interiors; six with the three 3-phase, 4-wire interiors. Space to add up to 36 extra circuits later.

Fronts: Either flush or surface type. Sturdy. Attractive gray finish. Separately packaged.

Thermal Magnetic Pushmatics. Famous "Push, it's ON, Push, it's OFF, Push, it's ON again" operation. Extra safety, extra convenience. Stock them yourself . . . have them ready when you need additional circuits.

TWO COMPLETE LINES

Single-Phase, 3-wire, Solid Neutral

(P2B-304-28L) 28 circuits Max., Mains 200 amp.
(P2B-304-40L) 40 circuits Max., Mains 200 amp.

3-Phase, 4-wire, Solid Neutral

(P3B-406-21L) 21 circuits Max., Mains 100 amp.
(P3B-406-30L) 30 circuits Max., Mains 100 amp.
(P3B-406-42L) 42 circuits Max., Mains 200 amp.

BULLDOG

BULLDOG ELECTRIC PRODUCTS COMPANY
DETROIT 32, MICHIGAN • FIELD OFFICES IN ALL PRINCIPAL CITIES
IN CANADA: BULLDOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO
PIONEERS IN FLEXIBLE ELECTRICAL DISTRIBUTION SYSTEMS

CONSULT THE FOLLOWING PACIFIC COAST REPRESENTATIVES

Coast Electric & Manufacturing Co.
1720 N.E. Sixth Avenue Tel. Tuxedo 5191
Portland 12, Oregon

Safety Switchboard Company
1445 Stevenson Street Tel. Hemlock 1-2470
San Francisco 3, Calif.

Paul L. Mallenbach Co.
3008 E. Olympic Blvd. Tel. Angelus 9-8101
Los Angeles 23, Calif.

More Miles of Cost-Cutting

INSTALLATION • The Emporium Stone Building, Stoneson Development Project "Stonestown," San Francisco, California.

Electrical Contractor: Charles A. Langlais Co.

Electrical Conduits: Rome • EMT.

Rome • EMT straight lengths are available in ½", ¾", 1", 1¼", 1½" and 2" while 90° elbows are carried in ¾", 1", 1¼", 1½" and 2".

• Warehouse stocks located as follows:

Chicago, Illinois
Dallas, Texas
Denver, Colorado
Los Angeles, California
Salt Lake City, Utah
San Francisco, California
Seattle, Washington
St. Paul, Minnesota
Torrance, California

Rome • EMT for San Francisco

Speeds up Wiring of "Stonestown's" Big Emporium Store

Easy workability—resulting in real *savings*—was an important factor in the choice of Rome • EMT electrical metallic tubing for "Stonestown's" big, new Emporium store.

The size of the project (286,000 sq. ft. in area and three merchandising floors) made it obvious to the electrical contractor that he needed a *lightweight* metallic conduit that could be installed quickly and economically . . . yet one which offered the utmost in safety and durability. The answer—Rome • EMT.

Lightweight Rome • EMT is easy to handle and bend. Simple compression type fittings eliminate time-consuming threading for connections. A mirror-smooth interior finish permits easy fishing and pulling. There are no burrs to slow up work or injure expensive cable.

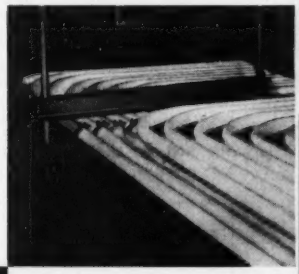
What's more, Rome • EMT provides exceptional protection against corrosion and abrasion. It has an electro-galvanized exterior with an even, solid zinc coating. Diameters and wall thicknesses are unusually accurate. Underwriters approved, it exceeds all standards for thin wall raceways.

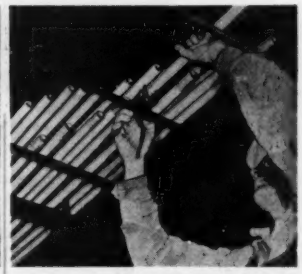
To further assure a safe, permanent power supply, more than 350,000 ft. of Rome wires and cables were used in the Stonestown development.

You will find it to your advantage to specify Rome • EMT, as well as Rome wires and cables for every wiring job. Contact your nearest Rome Cable office for help in planning your requirements.

For unexcelled wire and cable performance:

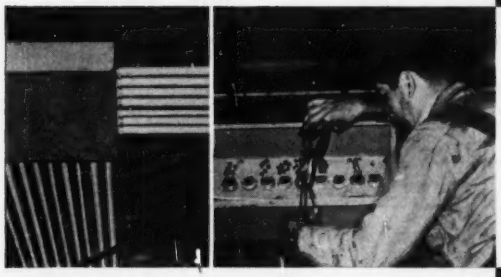
RoZone® RoLene
RoMarine RoFlex
RoPrene® RoBarn
Rome Synthinol®





EASY TO BEND • The simplicity of bending Rome • EMT makes it readily adaptable to any layout.

EASY TO HANDLE AND CONNECT • Rome • EMT is exceptionally light in weight . . . permits simple, one-man handling with threadless compression type connectors.



EASY TO FISH • The interior surface of Rome • EMT is "clean as a shotgun barrel" with antifriction high-gloss finish.

It Costs Less to Buy the Best

ROME CABLE
Corporation
ROME • NEW YORK
and
TORRANCE • CALIFORNIA

ROME CABLE ROME, N.Y.

WESTERN SALES OFFICES AND WAREHOUSES

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P-L EARTH ANCHORS

FOR ANY JOB FROM THE SMALLEST LINES TO POWER TRANSMISSION LINES

All P-L Steel Expanding Earth Anchors are designed to give maximum holding power with minimum installation cost.

P-L 2-WAY ANCHOR (6" & 8" DIA.)

Six sizes—with nominal holding power classifications from 2500 to 12,000 pounds.

P-L 4-WAY ANCHOR (8" DIA.)

Three sizes—with nominal holding power classifications from 6000 pounds to 10,000 pounds.

P-L 4-WAY ANCHOR (HEAVY-DUTY)

(10" dia.—projected area of 200 square inches expanded)

One size for transmission and heavy distribution lines with nominal holding power classification of 20,000 pounds.

Write today or contact your preferred distributor for information and literature.

PIEPER-LILLARD, INC.

ST. LOUIS 22, MISSOURI

MAKERS OF WIRE STRINGING PULLEYS
CHAIN BINDERS • SPREADING TOOLS
SADDLE ASSEMBLIES

BULLETINS ETC.

(32) MOTORS—Allis-Chalmers Mfg. Co., 939 S. 70th St., Milwaukee, Wis., gives construction features of its low-speed coupled-type pedestal-bearing synchronous motors in bulletin 05B7648. This type motor is available in ratings approximately 100 hp and larger at speeds of 450 rpm or less. Motors of 1.0 power factor or 0.8 or better leading power factor are available.

(33) CONNECTORS—The Thomas & Betts Co.'s 56-page bulletin 66 lists and illustrates the manufacturer's three lines of pressure fittings: Lock-Tite, Tite-Bind and Hinjon. The new bulletin lists connectors, lugs and taps for all kinds of copper conductors from No. 14 through 2,000,000 cir mils. Copies are available from the manufacturer at 70 Butler St., Elizabeth, N. J..

(34) LINEMAN'S ACCESSORIES—Catalog H-5 from W. V. Haynes Co., 100 S. Bay Ave., Boston 18, Mass., lists lineman's suits, raincoats and accessories.

(35) LIGHTING—Commercial fluorescent lighting equipment made by Mitchell Mfg. Co., 2525 Clybourne Ave., Chicago 14, Ill., is covered in a new 28-page bulletin.

(36) AIR CONDITIONING—Equipment for air conditioning, handling and cleaning is described in booklet B-5164 issued by Westinghouse Sturtevant. The 16-page booklet is available from Department T, Sturtevant Division, Westinghouse Electric Corp., Hyde Park, Boston 36, Mass.

(37) SWITCHES—Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn., tells about its rotary packet switches in a 12-page bulletin. These switches are made for electrical circuits operating at 10, 25, 30, 60, 100, 200 and 500 amp, from 115 to 600 v a-c and up to 250 v d-c.

(38) SELECTOR—A pocket-size beam load selector for its metal framing is offered by Unistrut Products Co., 1013 W. Washington Blvd., Chicago 7, Ill.

(39) CARBON PRODUCTS—A 20-page catalog section, S-5005, on carbon and graphite and Karbate impervious carbon and graphite products is available from National Carbon Co., Division of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.

(40) ILLUMINOMETER — New equipment for continuous recording of daylight intensity is listed in folder ND46-72 (1) published by Leeds & Northrup Co., 4934 Stanton Ave., Philadelphia 44, Pa.

(41) F LAMPS—Prices and technical data on fluorescent lamps and auxiliary equipment are listed in a recent folder, LS-101, from General Electric Lamp Division, Cleveland 12, Ohio.

(42) WELDING—Victor Equipment Co., 844-54 Folsom St., San Francisco 7, has published a 63-page catalog, 20-C, giving specifications of its welding and cutting equipment.

(43) WIRE AND CABLE CHART—Correct fittings for five different types of wire and cable are shown in a cable and connector size chart offered by the Thomas & Betts Co., 70 Butler St., Elizabeth, N. J.

(44) PROTECTIVE LIGHTING—Complete plans for outdoor industrial lighting are given in a 24-page booklet, "Light for Plant Safety and Security," available from Westinghouse Electric Corp., Box 2099, Pittsburgh 30, Pa.

(45) HEATERS—Packaged heaters, immersion, circulation and others with built-in controls, are described in a folder recently issued by Edwin L. Wiegand Co., 7500 Thomas Blvd., Pittsburgh 8, Pa.

ELECTRICAL WEST
68 Post St., San Francisco 4, Calif.

Not good after March 1

Please send me, without obligation, the new product information or catalogs described on the following pages and identified by numbers circled below:

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21 22 23 24 25 26 27 28 29 31 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45

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COMPANY*.....

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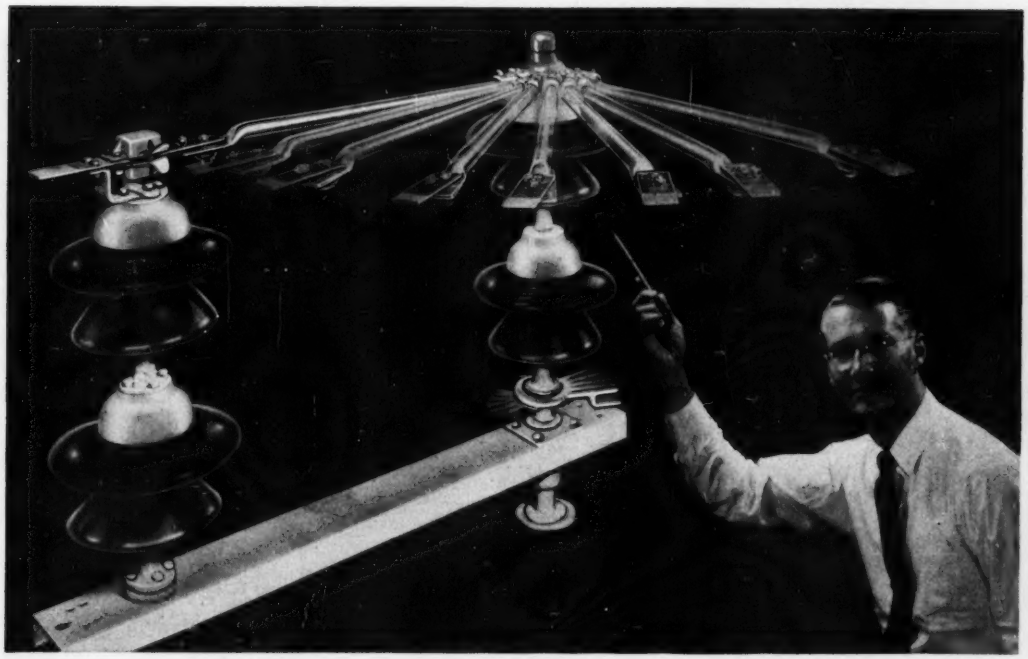
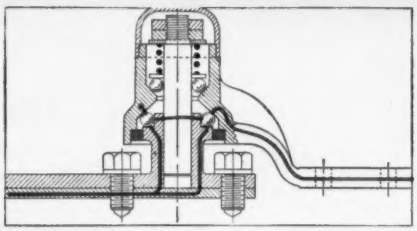
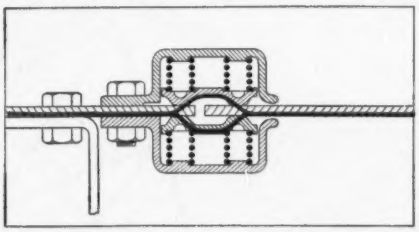
*** Please include your company's name and your position, since we cannot ask manufacturers to furnish literature unless you do.**

Announcing...the New G-E Type RB side-break disconnecting switch





Schematic diagram of blade-pivot housing with current path indicated in red.



Schematic diagram of stationary contacts with current path indicated in red.

Current-carrying solid spheres replace troublesome flexible braid conductors

The new G-E Type RB side-break switch successfully eliminates the short-lived flexible braid conductor which is a frequent cause of switching difficulties and high maintenance costs.

In the new design, current passes through the hard copper spheres in the blade-pivot housing. These spring-loaded spheres provide a low-resistance path and at the same time assure effective pivot action by the blade actuating mechanism. A housing shields the spheres from ice and dirt accumulations, thus assuring trouble-free operation even under adverse conditions. The switch can be adjusted in the field so that blade opens either to the right or left to take full advantage of space conditions.

Other advantages include: shielding of the stationary contacts; silver-to-silver contact surfaces; direct-torque blade action—no cams, rollers or complicated linkages; and a minimum number of insulator supports per pole.

G-E Type RB switches are available in voltage ratings from 7.5 to 69 kv. For complete information, call or write your nearest G-E sales representative. ***General Electric Co., Schenectady 5, N. Y.***

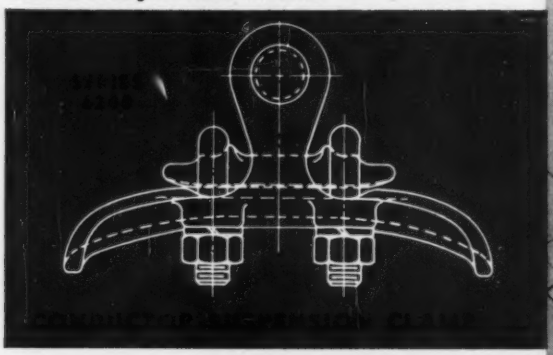
GENERAL ELECTRIC

853-6

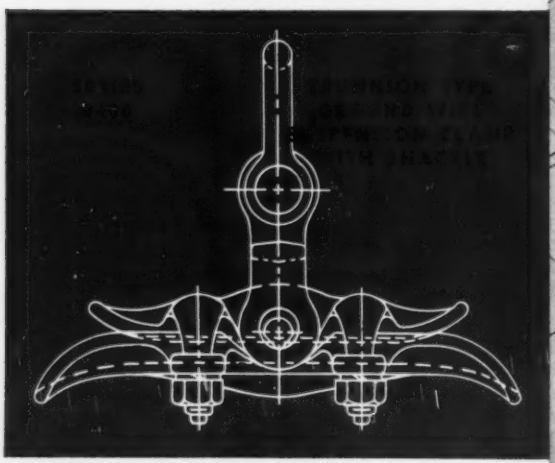
With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

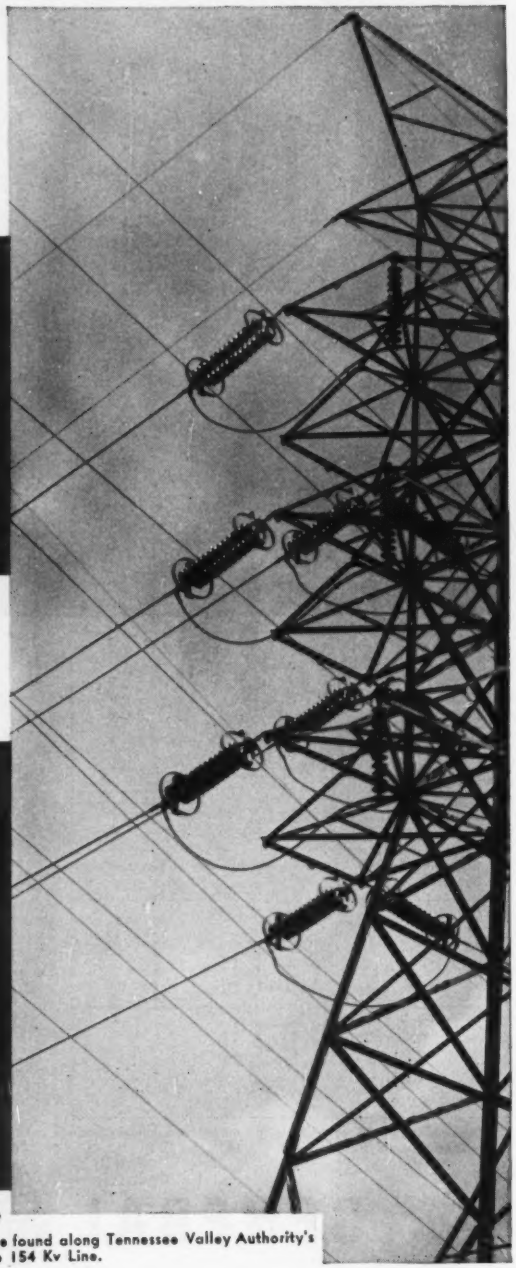
TIE LINE IN

THIS 154 Kv line crosses rolling country and mountainous terrain to connect Tennessee Valley Authority's Chickamauga Dam with its Hiwassee Dam 65 miles away. Constructed in 1940, the line later was looped into Apalachia Dam and Cleveland Primary Sub-station bringing its overall length to some 70 miles.



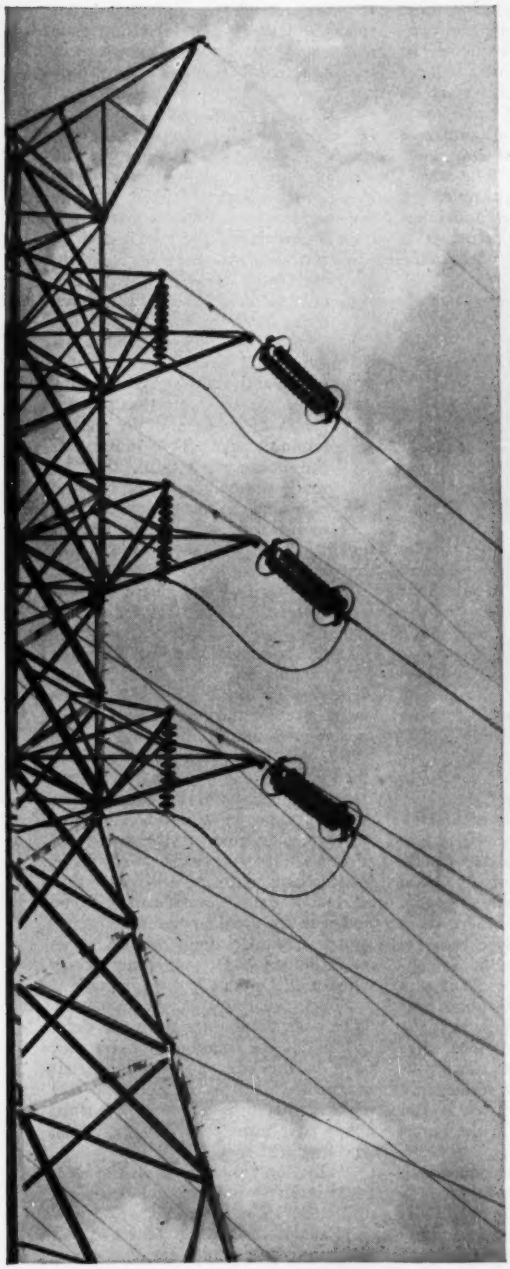
Serving as a tie between hydro-electric plants, this TVA line employs 636,000 cm A.C.S.R. Conductor under 9000 lbs. tension, 7/16" H.S. Steel Ground Wires at 6000 lbs., 1400 ft. spans, 1/2" ice and 8 lbs. wind at 0° F. BTC Drop Forged Steel Clamps and Transmission Line Hardware were installed when the line was erected.

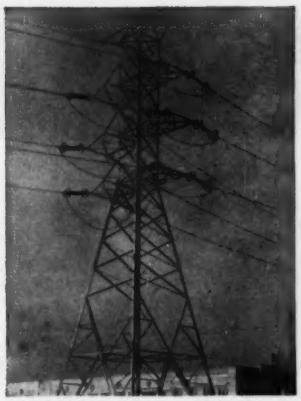




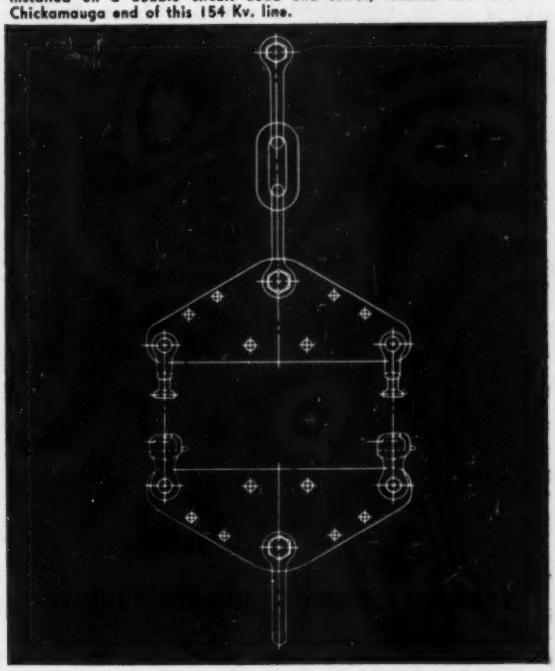
TYPICAL 90° TOWER • This double circuit dead end 90° angle tower is typical of those found along Tennessee Valley Authority's Chickamauga-Hiwassee 154 Kv Line.

TENNESSEE





● **END OF THE LINE** BTC Insulator Hardware, shown here, is installed on a double circuit dead end tower, located near the Chickamauga end of this 154 Kv. line.



Why not specify BTC Drop Forged Clamps and Fittings for all your transmission line projects? You'll find — as so many utilities and construction firms already have found — that BTC Clamps and Fittings are easier to install, give efficient trouble-free performance and help keep maintenance at a minimum.

Sold Through Your Insulator Manufacturer Only.

Drop Forged BTC Hi-Line Hardware

The BREWER-TITCHENER Corporation

Cortland · New York

ELECTRA'S HUSBAND

"DOES anyone outside of business give a damn how business works?" Electra asked one night at the dinner table as a sign of her boredom with the shop talk, which had engaged our male guest and myself for the better part of half an hour. "Frankly, Mrs. Collins and I might just as well be in another city."

"You just asked a very leading question," Ash Collins said to her. "It brings your husband and me to the crux of our discussion and lets you ladies into the act. By asking what you did, you simply proved the point that big business has almost completely outgrown public understanding. It has been so busy doing business that it has forgotten to tell its story to the people. Many years ago Owen D. Young, at that time president of General Electric, said something that I remember to this day. He remarked that only one danger confronted the electrical industry. It was that the growth of our industry would outrun public understanding and that people would come to see and fear our size without understanding our service."

"That happened a long time ago," Electra commented. "It seems to me that the electrical industry has been getting kicked around for years because people don't understand it."

"That's right," Ash continued. "Because of its size the folks at the top lost their neighborly touch with their employees and with the public. Under the circumstances it was natural for both to fall prey to political demagogues and unscrupulous labor dictators."

"Speaking of labor dictatorships," I interrupted, "did you hear what the local union did when the power company proposed that its people take the day before Christmas off? It insisted that everybody who had to work be paid double time. So nobody got a four-day Christmas holiday week end."

"But what are businessmen going to do about things such as that?" Mrs. Collins asked.

"Gnash their teeth and swear at the government and the unions," I answered.

"There is a better remedy than that," Ash commented. "Business, and in this case I mean our industry, must start telling its story simply and consistently at the grass-roots level. In the final analysis, all business is local just the same as all politics start on the local level."

"There must be a lot of companies in the electrical business who don't know that," Electra said. "The advertisements I've read aren't simple."

"That's because lawyers and engineers pass on the copy before it is run," I said. "People can't unscramble the involved story and besides they're not interested. Furthermore they don't have time. Our folks want to talk about the past in their advertising when the past should only be used as a guide for the future."

Has Industry Outgrown Public Understanding?

"Somebody not long ago said you can't reach the mass of the people with a symphony orchestra," Mrs. Collins said. "Too much advertising uses the symphony approach."

"Let's not alienate the lawyers and engineers in our industry," Ash said. "After all they have made great contributions to its progress and its success. But the fact remains that people think, buy and vote emotionally. Most of all they elect emotionally. We talk about our good service when, as a matter of fact, good service becomes a habit so far as the public is concerned. People grow to expect it as a matter of course. We talk about our low rates, when surveys show that the majority of people have no idea what their electric rates are. It's dangerous to tie the industry's flag to service and low rates. The railroads tried it and many of them ended up in the bankruptcy courts."

"Wait a minute," I countered. "How is our industry going to tell this story simply and effectively when its advertising budgets proportionately are the lowest of any major business? It costs money to buy newspaper space and radio and television time and talent—real money if you expect to compete for the customer's time and attention."

"Our industry must put more tools to work to tell its story," Ash continued. "Folks say we don't have any competition. We are competing with every other industry. Furthermore we are handicapped because we don't have a new model every year and we can't put kilowatt-hours out in bright and shiny new packages. The automobile folks certainly have it on us there. One of the top men in the biggest auto company said recently that style, paint and upholstery sell cars. They are the things that put the gleam of pride and joy in the feminine eye. The master of the house may think that he made the choice of car because of a dual carburetor system or a high-compression motor, but it's the little lady who says, "We'll take that one."

There was a wicked gleam in Electra's eye as she looked at me but Ash did not give her time to interrupt.

"For a cue on how to sell, we ought to study the soap ads," he continued. "They cater to the emotions, wants and desires of the female sex. I read an ad in Sunday's magazine section of the local paper that said something like 'Let YOUR Beauty Be Seen—Palmolive brings out beauty.' The smallest type in the advertisement was the signature of the manufacturer. There was another ad about White King soap and I'll wager that neither of these women can tell who makes it. Do you know why? The Los Angeles Soap Co. doesn't even sign its advertisements? Do you women know where Old Dutch Cleanser is made?"

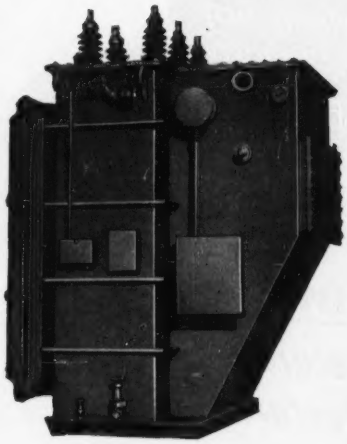
"They wouldn't," I commented. "The soap companies certainly don't talk about the amount of taxes they pay, or the size of the plant that makes the soap or the chemical formula of the stuff. There isn't a word about past history or the great men who invented soap."

"Why don't the people in the electrical industry unbend and really get dramatic?" Electra asked.

That's a good place to leave this discussion. Why don't they?

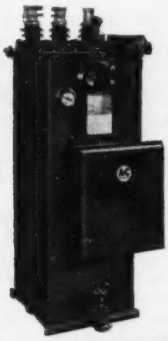
Large or Small-

5/8% STEP REGULATORS



AFR
Three phase regulator, sizes through 69 kv, 2500 kva.

DFR
Single phase regulator, sizes through 6900 v, 250 kva.



JFR
Single phase regulator, 11.4 and 38.1 kva, 7620 v.

YOU GET THESE SAME plus features

7 QUALITY FEATURES YOU GET ON ALL ALLIS-CHALMERS REGULATORS

- ★ ⅝% steps
- ★ Close regulation (± 1 volt band)
- ★ Easy control adjustment. The same type of control used on all sizes
- ★ Close average voltage for all types of loads (maintained by voltage integrator)
- ★ Long life contacts of liberal design to withstand hundreds of thousands of operations
- ★ Tap changing drive mechanism with balanced spring action to eliminate shock . . . operates under oil for long trouble-free life
- ★ Unit construction to simplify maintenance

IN ADDITION to these important features, the single phase ⅝% step regulators require only 1/3 the exciting current of older types of single phase regulators. Low exciting current releases system capacity for useful loads.

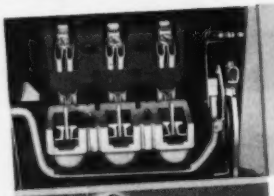
You can count on Allis-Chalmers for regulation that helps boost capacity, increase revenue, and improve customer good will.

Get complete facts on Allis-Chalmers ⅝% step regulators from your nearby Allis-Chalmers district office, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

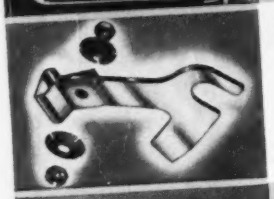
A-3571

ALLIS-CHALMERS

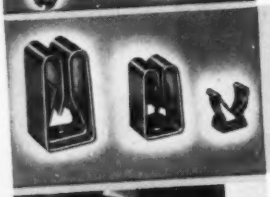
Originators of ⅝% Step Regulation



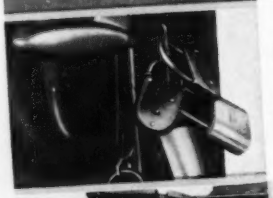
Magnetic Arc Suppressors "blow out" the arc, contribute to exceptionally high interrupting capacity.



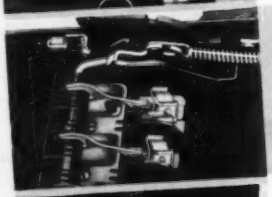
Spring-Loaded Blade Hinges for pressure contact. **Silver plated** current-carrying parts. Not flash plated but completely plated to reduce temperature rise.



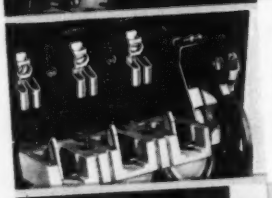
Positive Pressure Fuse Clips reduce heating at fuse contacts 60% or more.



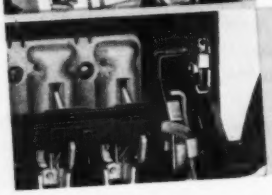
Padlock Attachment locks switch "ON" or "OFF" with 1, 2, 3 or 4 padlocks of virtually any shape or size.



True Quick-Make, Quick-Break Mechanism design makes it impossible to retard or to "tease" the operation.



Dead Front construction. All exposed parts are dead when switch is in "OFF" position. **Hinged Arc Barrier** makes it easy to reach line terminals.



Full Cover Interlock Switch cover can be opened or closed by authorized personnel without removing parts or interrupting service.

FACT: *Square D Type A Safety Switches are the overwhelming first choice of industry*

REASON: DESIGN LEADERSHIP

PROOF: *a feature-by-feature comparison*

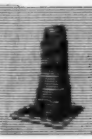
ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

DETROIT • MILWAUKEE • LOS ANGELES

SQUARE D COMPANY CANADA LTD., TORONTO • SQUARE D de MEXICO, S. A., MEXICO CITY, D. F.

ELECTRICAL WEST
SPOKESMAN FOR THE MOST HIGHLY ELECTRIFIED SECTION OF THE U. S.



SERVICE IS OUR BUSINESS

During period of dramatic new developments, electric industry must not slacken everyday efforts to improve products and methods and lower costs. It must use the attributes that made it great to maintain and better its position in an aggressive free-market economy

J. H. JEWELL*
Vice-President of Sales,
Westinghouse Electric Corp.

Our industry's outstanding record is the result of its past recognition of the importance of service. Likewise, our ability to rise to the opportunities and responsibilities ahead of us depends on recapturing these attributes that made us great.

To the manufacturers, service means a continuous search for better materials, improved designs, better production methods, and new ideas that will expand our list of customers. Service to the utility industry means transmission lines and distribution systems over which is delivered more and more energy to more and more customers at lower and lower rates. To the electrical wholesaler, dealer and contractor service means satisfied customers and satisfied customers mean an expanding business. In a word, "service" in the electrical industry means "growth."

First, let's examine the electrical manufacturer. In the research and development phase, the manufacturer must continue to expand efforts to provide the materials and new designs needed. The electric manufacturing industry is working on developments designed to fit into the future growth pattern. These in turn are opening new vistas that will keep our engineers busy far into the foreseeable future. In the short-range future is the gas turbine-generator as an example. A number of these in ratings of 5,000 to 15,000 kw already have been installed or are on order. Experimental industrial gas turbines have been in commercial service for several years and more recently have been applied to railroad locomotives.

We are working closely with the Atomic Energy Commission to make atomic energy available as a source of heat for generating electric power. Five large utility companies are also studying this problem in cooperation with joint contractors.

Important also is the development of vitally needed new alloys. Without new metals there can be little improvement in the reliability and output of equipment for the electric industry.

The achievement of dramatic new developments by the electric industry, however, is not enough. There is a less romantic but equally important job to be done. This is the application of existing knowledge in the framing of well-planned and organized development programs for our regular standard products. We must not slacken our everyday efforts toward the improvement of products and methods and the lowering of costs.

Such a development program embraces three phases: First, the examination of current mass-produced items as to where redesigning will reduce price while maintaining, or improving, quality; second, a search for major improvements in products now being manufactured; finally, the long-range development of materials that will clear the way for the making of wholly new products.

The electrical equipment manufacturer also needs to expand his efforts to help industry apply our existing products and knowledge. We need more well-trained application engineers who are specialists in each industry and who by thorough knowledge of the possibilities of the available equipment can help to apply it advantageously. Peak demands have permitted the operation of marginal plants, but this should not be continued, for it represents waste. We should not wait for the pressure of competitive prices to initiate the needed industrial modernization. Cost reduction through modernization of equipment should be a continuing program, not an emergency measure.

The electric utilities have been the major factor in the growth of the entire electric industry. They have done this through their willingness to take a reasonable financial risk and by developing new and more efficient generation and distribution systems. The results are reflected in national figures for the past ten years. During this period, the price per kilowatt hour decreased 12% from 2.06 to 1.81 cents despite a rise of 219% in cost of materials added to a 109% jump in wage rates. The over-all cost of living during the same period increased 71%.

However, I believe a period of successive new highs has made the utilities underrate the need for continued aggressive promotion efforts.

Despite the unlimited horizons ahead, utility sales organizations must not be neglected. Following the war, the greatest seller's market in our his-

* Based upon an address before the second annual Hawaiian Conference, Pacific Coast Electrical Assn., Honolulu, Nov. 29-30, 1951.

tory caused appliances to reach record volume sales. By 1949, however, this flood of orders had slackened and we were faced with the first real sales test of the postwar period. What did we find? We discovered that creative salesmanship was found wanting. Our retail selling effort consisted of response rather than creative selling and as a result our salesmen, many of whom were reared in this atmosphere of complacency, were not applying the selling techniques that were so essential to move goods in the thirties. I believe we are inclined to disregard some of the sales programs and sales promotion ideas that were so successful in the past. Have we forgotten the gains made by lamp sales campaigns; the promotion back of refrigeration and electric cooking? I believe that more of this type of aggressive selling must be supported by the utilities; also that closer cooperation to develop sales activities is vital if we are to market our products and services successfully.

We haven't scratched the surface of materials handling and air conditioning possibilities; we haven't pushed the heat pump. There are unlimited possibilities for the sale of both equipment and electrical energy in farm production. The sellers' market of the last decade has left scars of complacency in our sales organizations that only the plastic surgery of an aggressive sales program can remove.

We have been looking at unrealistic selling cost ratios during the recent years and there is great danger that these figures will become "normals." We cannot live with these low selling costs and must plan to return to spending for sales on previous levels.

Facts of Life for Industry

I also believe that utilities share the manufacturer's responsibility of bringing cost-saving equipment to the attention of all industrial customers. Industry is faced with the following facts of life: (1) Steadily increasing labor costs; (2) a restricted labor supply; and (3) a larger tax burden. The chief hope for meeting these is the savings we can bring industry through intelligent application counsel.

High priced, nonproductive labor —and especially materials handling and maintenance—has made industry take a long, hard look at methods to reduce these costs through the use of electric power. Before the war, one man at 75c an hour could load and transfer a pallet of goods. Today two men at $1.50 an hour will be required by the reigning union to do the job. Thus, power salesmen should seriously study manufacturing costs as affected by current and foreseeable wage rates because this is another factor in forecasting industry's needs for additional electric power.

Rising labor costs are also contributing to load growth in causing many industries to increase productivity by stepping up the speed of processing lines. This is especially clear when one considers that doubling the speed of a processing line frequently triples or quadruples the power required.

Service Is Essential

The utility industry, therefore, needs to continue its program of assuring the availability of current in advance of its need. In addition it needs to recapture its former youthful and energetic promotional efforts in the consumer, industrial and commercial fields. In this way it can provide the service needed if our economy is to realize its potential growth.

The wholesaler, dealer, and electrical contractor provide essential links in our distribution. They must, however, make certain that they provide the services that are their reason for being.

The wholesaler must return to having the right product at the right place at the right time. He needs to provide the trained, specialized selling effort needed to serve today's complex markets.

The tremendous acceptance of television has pointed up a major weakness in our industry that many of us are inclined to overlook—service to owners of electrical products. This responsibility, while one to be shared by all of us, should be a major concern of the electrical dealer, the manufacturer's principal point of contact with the public.

While postwar sales in the electric industry have been lush, they may not always continue to be so. It is axiomatic that good service leads to increased sales. The two are complementary. This has been conclusively proved by the automobile dealers who, by doing an outstanding job of service to customers, have bettered their sales, increased their customers and generally made a better friend of the public as a whole and they have made money doing it.

With the average residential load increasing rapidly, tremendous amounts of new equipment are daily coming into the home. But when an automatic washer, or a radio, or a television set has been sold the dealer should feel that the sale is only partially completed. Until the day when electric products are perfect and everlasting, they are going to require service. And the public, who buys them, must receive better service than they are now accustomed to.

Joint Action Needed

In reviewing the needed action in the three major segments of our industry, it becomes clear that our individual progress is closely associated with our progress as a group. In addition to the problems already discussed, there are industry-wide problems that need our joint attention.

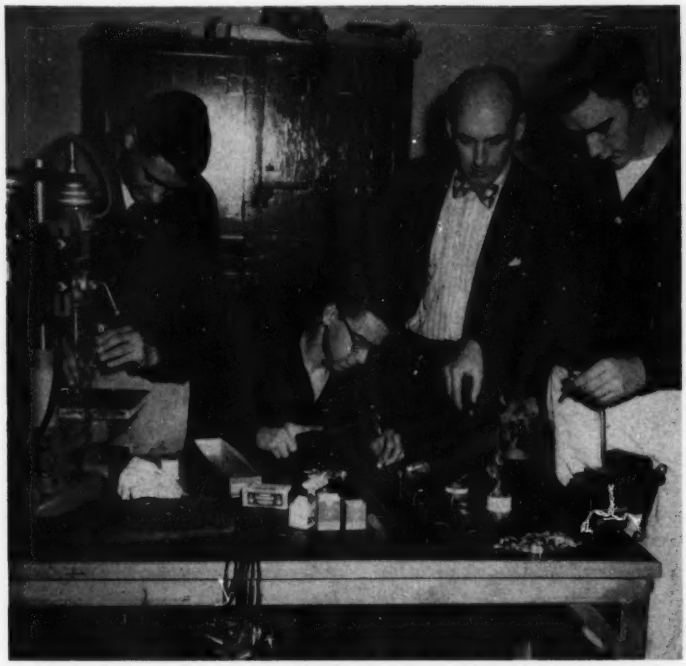
First is the need for a continuing supply of new technically trained personnel for our industry. We must sell the engineering profession to the youth of America's high schools.

Equally important is the job of public relations—of telling our story to the American public. Electric rates are the lowest in history; we are supporting the federal government with tremendous tax revenues; we are maintaining good working conditions; we are giving real, personal community service meshed carefully with local needs; we are contributing materially to the growth and betterment of each community served. Above all, we are successfully raising the standard of living throughout the nation—not leveling it in the manner of socialistic governments. The electrical industry is leading the battle against creeping controls.

Finally what we of the electric industry have to gain—and keep—by remaining strong is of importance to the nation's entire welfare. This is not the time to conclude we've gone far enough; that our loads are sufficient, our factories big enough. Such a mental outlook is not conducive to an expanding and growing industry. We must sell our customers on the soundness of the electric industry and of our particular part in the nation's business.

Our pioneering founders took courageous steps that made the industry's growth possible. They presented us with an opportunity for growth that is virtually beyond imagination. Faced with this future and at the same time with equally greater political problems, the electric industry today must take positive and powerful action to maintain and better its position in an aggressive free-market economy.

The electric industry must retain—and where it has lost it, regain—the initiative in exploring new fields where it can serve the public.



One step in the production of house number lights is completed by high school seniors under Ralph Worth, meter specialist, in Pacific Power & Light Co.'s experiment with

Free Enterprise—Junior Grade

Youth Products Co. of Portland completes first year of operation. Production, merchandising, financing, wage scales are some of business problems solved by twenty teen-age boys and girls in Junior Achievement group

Material shortages furrowed the brows of the board of directors. The company's product, a house number light which operates from the ordinary doorbell transformer, was made primarily of aluminum. The production manager had just reported that aluminum might be in short supply before long. One of the board members said, "Let's start hoarding this stuff now." "No, no," suggested the sales manager, "Let's call it stockpiling." The purchasing agent was authorized to buy six months' supply of aluminum immediately and the discussion turned to the matter of completing the current common stock sale.

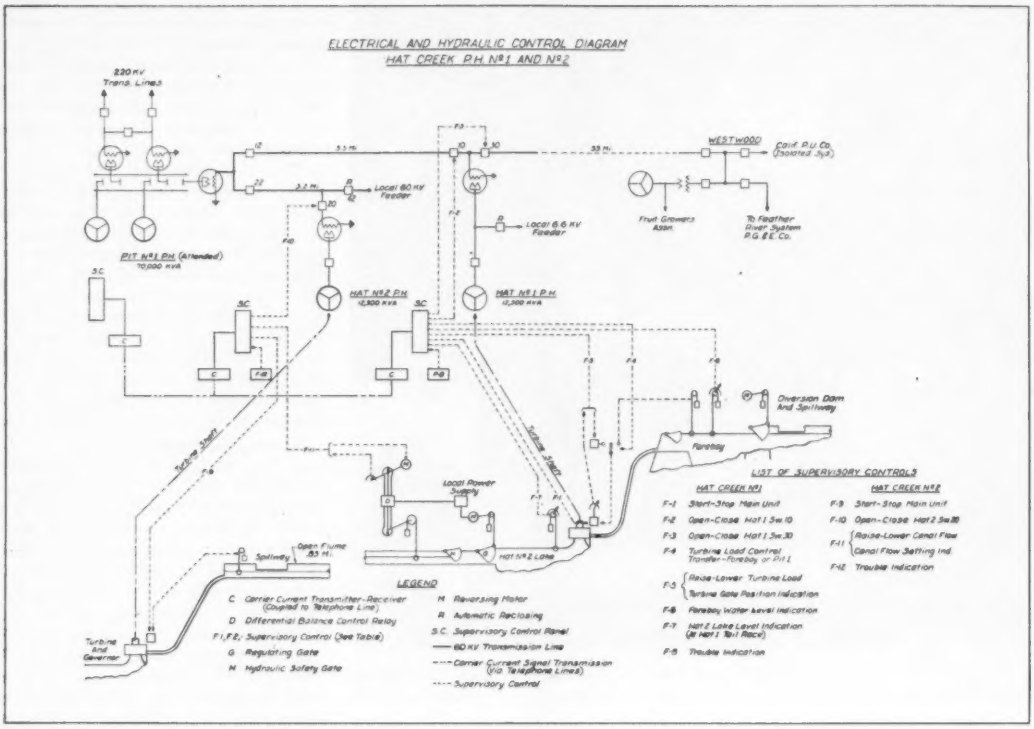
Was this a board meeting of a large industrial corporation? Were these important corporate executives laying a course of action that would involve millions of people? No, it was a meeting of the board of directors of the Youth Products Co., a Junior Achievement group operated by high school teen-agers. Last year this junior company along with more than 1,000 like companies participated in a national program which provided the Junior Achievers with business experience prior to their employment as adults.

Pacific Power & Light Co. of Portland, Ore., sponsored Youth Products Co. Leonard Bennett, property agent, Ralph Worth, meter specialist, and Dan Webster, salesman, in Pacific Power, served as accounting, production and sales advisors respectively. So great was the interest of these advisors in the junior company that not one of them missed a meeting of Youth Products Co. during its year of operation.

The first four weeks of the new company's life were spent in organization. During that time, the twenty senior students from Portland high schools selected a product to produce and merchandise, elected officers, sold stock, determined on sales commissions and set wage scales. Rental of tools and purchase of raw materials were completed by the fifth week. Production techniques were ironed out and then the production process was divided among the members according to their skills. Money to start the young company in business was raised by sale of common stock to the public. Many of the 50c shares went to Pacific Power employees. The stock sale raised $90 but the treasury department quickly learned that $90 is a comparatively small amount of cash.

Shortage of capital became a problem that had to be faced squarely. Upon the financial advisor's suggestion, they sought and obtained certain credit privileges from one of their suppliers. As a result, production continued to roll smoothly. Youth Products Co. produced 201 house number lights, all of which were sold. At full production, the corporation had a monthly production of 50 units. Each light cost 97c to produce and retailed at $1.85. In keeping with its miniature operation, Youth Products set its wage at 15c per hour. However, members earned a 25c commission on each unit sold. Working hours were from 7 to 9 p.m. each Monday night. Even with this two-hour-a-week schedule, the company learned about absenteeism, but that did not hamper production too badly because the president and all officers worked right alongside other company members on the production line. With high school graduation, the company liquidated its assets and prepared an eight-page report to stockholders, which showed the books balanced and a 10% dividend declared on the common stock.

Because Pacific Power & Light Co. feels that this opportunity for youth to learn from actual self-acquired experience is one of the best insurances against any national "switchover" from our present economic system, it is again sponsoring a new Junior Achievement company which is now being organized. The Roman Orator Cicero said, "What greater or better can we offer the State than if we teach and train up the youth." We might add, "And how can we better teach and train up the youth in our free enterprise system than by sponsoring free enterprise, Junior Grade, through the Junior Achievement program."


ELECTRICAL AND HYDRAULIC CONTROL DIAGRAM
HAT CREEK P.H. Nº1 AND Nº2
220 KV Trans. Lines
WESTWOOD
Calif. P.U. Co. (Isolated Sys.)
Local 60 KV Feeder
Local 6.6 KV Feeder
Fruit Growers Assn.
To Feather River System P.G.&E. Co.
PIT Nº1 P.H. (Attended) 70,000 KVA
HAT Nº2 P.H. 12,500 KVA
HAT Nº1 P.H. 12,500 KVA
Diversion Dam And Spillway
Forebay
Turbine Shaft
Local Power Supply
Spillway
Open Flume .83 Mi.
Hat Nº2 Lake
Turbine And Generator
LIST OF SUPERVISORY CONTROLS
HAT CREEK Nº1
F-1 Start-Stop Main Unit
F-2 Open-Close Hat 1 Sw. 10
F-3 Open-Close Hat 1 Sw. 30
F-4 Turbine Load Control Transfer—Forebay or Pit 1
F-5 Raise-Lower Turbine Load / Turbine Gate Position Indication
F-6 Forebay Water Level Indication
F-7 Hat 2 Lake Level Indication (at Hat 1 Tail Race)
F-8 Trouble Indication
HAT CREEK Nº2
F-9 Start-Stop Main Unit
F-10 Open-Close Hat 2 Sw. 20
F-11 Raise-Lower Canal Flow / Canal Flow Setting Ind.
F-12 Trouble Indication
LEGEND
C Carrier Current Transmitter-Receiver (Coupled to Telephone Line)
D Differential Balance Control Relay
F1, F2, Supervisory Control (See Table)
G Regulating Gate
H Hydraulic Safety Gate
M Reversing Motor
R Automatic Reclosing
S.C. Supervisory Control Panel
60 KV Transmission Line
Carrier Current Signal Transmission (Via Telephone Lines)
Supervisory Control

Schematic electrical and hydraulic control diagram for Hat Creek plants showing list of supervisory functions available to personnel

New-Type Hydro Plant Automatic Control

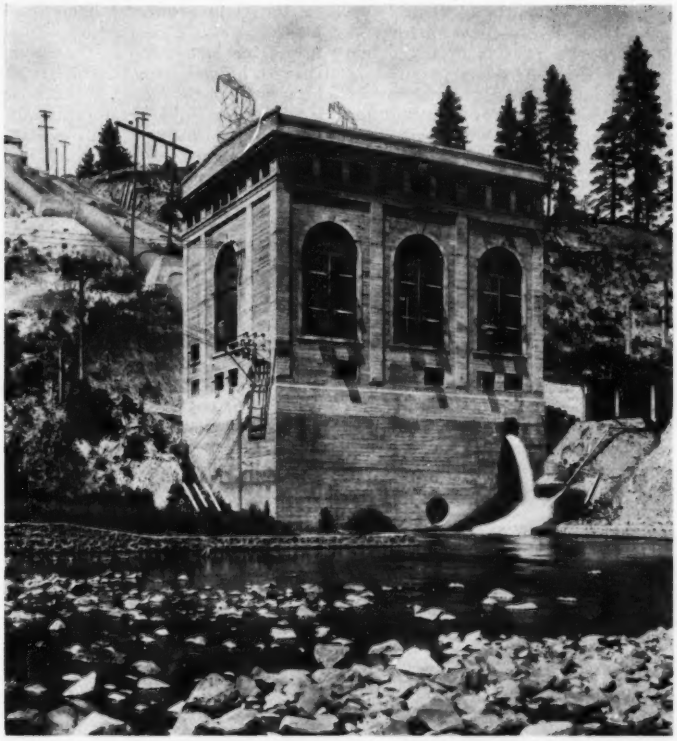
Two 12,500-kva plants are put under combination of self-contained automatic and supervisory control

Frank I. Lawson

Assistant Engineer, Department of Engineering
Pacific Gas and Electric Co., San Francisco

An interesting development in the postwar modernization program of the Pacific Gas and Electric Co. has been the addition of automatic and supervisory control to two of the smaller plants in this company's development of the Pit River basin in northern California east of Redding, thus converting them from attended to non-attended operation. These plants, known as Hat Creek 1 and 2, on a tributary of that name near Pit River power house 1, were forerunners in the development of this area. Both

Governor with automatic control cabinet (left). Right: Governor load limit follower device

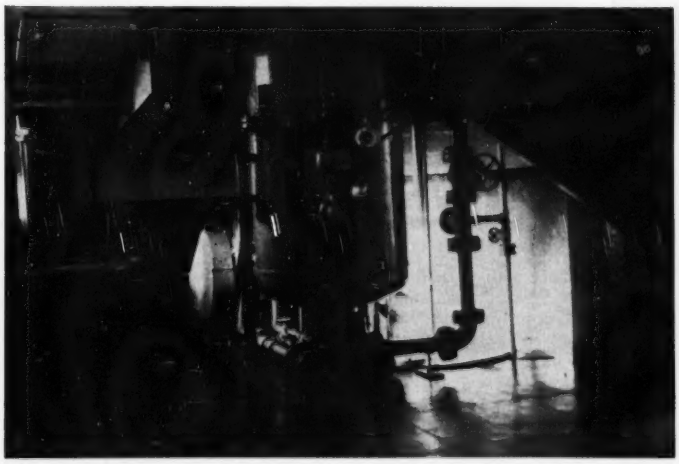


Hat Creek 2 plant, one of two small plants combining automatic and supervisory control

were built in 1919-20 as a joint venture between Pacific Gas and Electric and the Red River Lumber Co., which at that time was lumbering in the Westwood area. It was power from these plants that initiated delivery, at reduced voltage, over the pioneer Pit River 220-kv transmission lines.

While these plants normally are tied to the company's main system through the Pit 1 bus, there are occasions during transmission line outages when each may become separated from the system with local loads to carry. These occasions call for remote switching under manual supervision. Also, while they operate essentially as stream-flow plants, their location, at an outlying part of the transmission network with a moderate amount of forebay storage available, was deemed to warrant having the program of conversion to automatic include remote manual adjustment of load.

Without these considerations it would have been the company's policy to install only the normal self-contained automatic control whereby each plant would be started by a master switch and then synchronized and loaded by forebay float control, according to stream flow. Automatic controls to accomplish these functions plus, of course, the usual protective features—some of which lock the unit out for inspection—and some of a less critical nature permitting automatic restart, are well understood in the industry. The Hat Creek plants are equipped to function in this manner and normally do so.



Governor oil pressure tank with automatic controls added for automatic plant operation

Supervisory Control Added

To this basic scheme of control there has been added a supervisory system controlling a combination of electrical and hydraulic features tailored to fit the operating conditions briefly outlined above. The main electrical connections and hydraulic features, together with the scheme of control, are shown in the accompanying diagram. The table on the drawing lists the supervisory control functions available to the personnel at Pit 1 for the operation of these plants and the related 60-kv transmission system.

It will be noted that hydraulically the two plants are in tandem on the stream, Hat 1 having a 12.5-acre-ft forebay consisting of a wide channel leading from a low diversion dam. A 120/90-in. penstock, 1,600 ft in length, brings the water to the turbine, from which it is discharged directly into the upper end of an artificial lake that serves as a 270-acre-ft forebay for Hat 2.

Normally the Hat 1 unit loads itself by forebay float control according to stream flow. Alternately the Pit 1 operator can take over remote control of the turbine load for peaking or other purposes. Or in case of low speed resulting from line switch operations, which leaves the plant carrying a load greater than stream-flow generation, a frequency sensitive relay

cuts out the float control, permitting the governor to restore normal speed if possible. At the same time turbine load control is transferred to Pit 1, which thereby delegates the duty of restoring normal loading to the operator at that point.

Between the Hat 2 forebay and Hat 2 penstock the water is carried in a concrete flume 18x7 ft in section and 4,520 ft long. Flow control for Hat 2 takes place at the entrance to the flume and the turbine is arranged to load itself according to the level of the water arriving at the head of its penstock. Except for the condition of local transfer to manual control, for temporary maintenance periods, load adjustments at Hat 2 are made only through control of flume intake.

The equipment for controlling the flow of water into the Hat 2 flume consists of an arrangement of two radial gates and a float control system. One of the gates is motor-operated and receives open or close impulses from the relative position of two slide-wire potentiometers. One of these is positioned by a float in the flume and the other by a small motor that is under remote supervisory control. Thus the level at which the motor-operated gate will maintain flow is determined by the balancing position of the two slide-wire potentiometers. The second gate is operated by a large float and is a simple safety device to restrict the flow into the flume to its maximum capacity if for any reason the normal control attempts to overstep this limit.

The Hat 2 intake control is notable from the standpoint of being able to correct itself for any rise or fall in lake level, and for its ability to maintain steady flow without dependence on the control lines. A report-back indication of the float setting is used to provide knowledge that a desired change in adjustment actually has been made at the intake. This reading is calibrated in generator kilowatts and serves to indicate plant load.

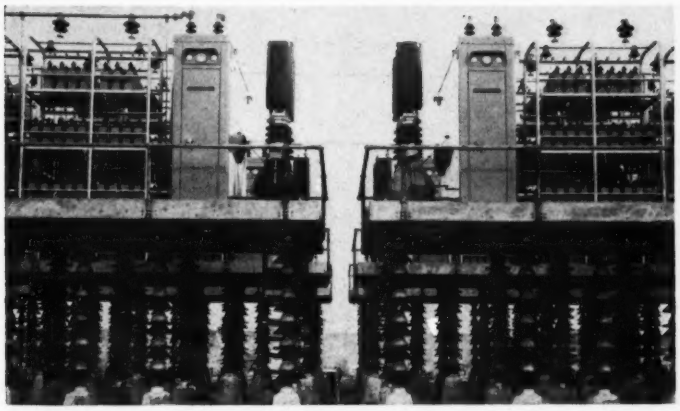
The remainder of the controls consist of standard supervisory arrangement of start-stop for the main units, open-close for the main 60-kv breakers and a trouble alarm signal for each station that groups a number of over-temperature or other abnormal indications into the one trouble signal for the plant.

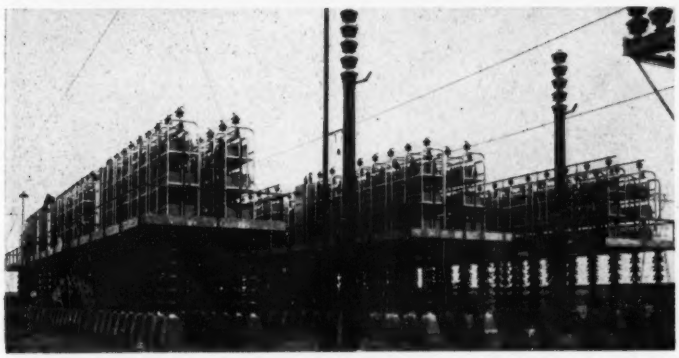
A major problem in effecting the conversion was the matter of adapting 30-year-old equipment to modern methods of control. These difficulties were satisfactorily overcome and the plants have been operated on an unattended basis for more than a year.

New Ladder Services 25% More Lamps

Latest type of equipment to be acquired by the maintenance division of the California State Highway department for maintaining lighting equipment and traffic signals is the ladder truck here illustrated. This is a manually operated extension ladder mounted on a one-ton Ford chassis with service body. The ladder reaches a height from the ground of 35 ft when fully extended, has a basket for the maintenance man, is rigid, rotates through 360°, is handwheel and chain driven and counterbalanced with heavy springs for ease of operation. Less than a minute is required, starting from the traveling position, to place the ladder in position for the operator to work on a light or signal.

Speed and ease of handling permit a man to service 25% more lights in a day than with various pieces of equipment used in the past. The photographs show one of six of these ladder trucks owned by the department in use on the San Francisco-Oakland Bay bridge with the one-man operator working on a sodium-vapor lamp. The ladder is made by the Los Angeles Ladder Co. and the equipment as shown was supplied by the United Transportation Co. of Redwood City, Calif.





Two views of the 90,000-kva series capacitor installation being made by the Bonneville Power Administration to equalize loading between two parallel 230-kv transmission lines

Series Capacitors Equalize Line Loading

A. Dovjikov

Branch of System Engineering
Bonneville Power Administration, Portland, Ore.

Economic considerations indicate that 230-kv lines, with loads above 200 mva per circuit at very high load factor, as carried in the system of the Bonneville Power Administration, should have conductors of cross section larger than 500 mcm copper equivalent used in the original two circuits from the Grand Coulee plant to Midway substation. A third new circuit having approximately the same reactance as the original lines will operate in parallel with them, being connected between the same buses. The new line has conductor of 800 mcm copper equivalent but, since reactance is roughly the same as the old lines, the three would share the load approximately equally, and the increased cross section of conductor in the new line would not be properly utilized.

To increase the current in this third 100-mile, 230-kv line and load it to its economic advantage, it is necessary to decrease its reactance by about 25%. Such a decrease will be accomplished by installing 90,000 kva in static capacitors in series with the line. Designed current loading of the 800-mcm copper equivalent circuit, with one of the other two circuits out for maintenance, is 1,150 amp. Reactance must be reduced 20.8 ohms, the 25% needed. These are ohms of series capacitor bank per phase.

Voltage drop across the bank at full rated load is 24,900 v per phase. This is distributed between three series connected groups of 10,000 kva each. Voltage drop across each group at full load is 8,320 v, distributed between two series connected sub groups of 5,000 kva each. Sub groups consist of 200 individual capacitors rated 25 kva each, 4,160 v. Each 5,000-kva sub group is protected by its own air blast gap to prevent overvoltage during faults. Gaps and compressors are located on the same insulated platforms as the capacitor sub groups. The motor of the compressor is driven by voltage obtained across each sub group. As this voltage is a function of the line load, the compressor motors are designed to operate in the range of voltages from 8,320 to 2,080.

The fundamentals of series capacitor application and description of all other protective means are the same as those described in the AIEE paper, 51-303, entitled "Functional Requirements of Series Capacitors in Long Distance Transmission Lines and a Description of Fundamental Features of the Installation in the Bonneville Power Administration System," by A. Dovjikov and E. C. Starr, presented at the Pacific General Meeting in Portland, Aug. 20-23, 1951. This discusses the original 15,000-kva installation of series capacitors in the 230-kv circuit at Chehalis substation of the Bonneville Power Administration.

The location of the bank in the middle of the circuit, its size, location of the compressors and motors, and the fact that the capacitors are in the open air instead of in cubicles, are different features as compared with the installation at Rocky Ford in the Midway line, here described.

The present installation of 90,000 kva of series capacitors is now in the final stages of construction and adjustment as shown in the accompanying photographs taken Dec. 7, 1951.

● **Series capacitors** in 230-kv systems have two important economic applications. One is their use as described in the preceding article. The other is for compensating for line reactance to increase line loading. Applications of the latter type are planned by the Bonneville Power Administration in conjunction with new transmission lines.

Tower view showing linemen placing first wrap of preformed shunt armor wires over high-resistance joint in 220-kv ACSR conductor

Preformed Rods Shunt Defective Splices

Preformed armor rod developed to place over defective joints in 220-kv ACSR conductors — eliminates lowering wire to cut out old splice

Jordan Lummis

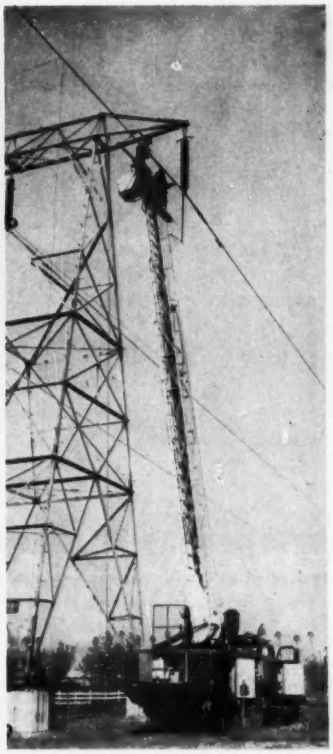
Transmission Engineer
Southern California Edison Co., Los Angeles

Methods of shunting high-resistance ACSR splices have been developed to a point where field application is practical. Southern California Edison Co. is now correcting defective splices after an intensive laboratory investigation made in cooperation with the Preformed Line Products Co. For 666,600-cir-mil ACSR the shunt consists of a group of 12 aluminum-alloy rods (61S-T91) each having a diameter of 0.308 in. The ends of each rod are preformed in a helix of slightly smaller diameter than the conductor and the mid-section, which crosses the splice, is straight. Over-all length of the formed rods is 150 in. and the total conductor contact length is 106 in. The accompanying photographs, taken from the top of a steel tower, show method of applying these rods.

The purpose of the shunt rods is to prevent overheating in a splice that has developed abnormal resistance from long-time internal corrosion and that might eventually fail mechanically. This is done, primarily, by shunting the current around the splice and, secondarily, by providing additional heat-radiation surface from the splice. While the shunts are not intended to provide mechanical strength, tests show they will develop at least 80% of the strength of the aluminum portion of the conductor. The shunts perform these functions adequately and they may be installed without the aid of such mechanical devices as wrenches, compressors or dies, also without disturbing the old splice and, generally, without lowering the conductor to the ground.

The shunts are installed on a dead line but the process can be interrupted at any stage and the line returned to service in a matter of minutes if an emergency arises. While fewer than 15 minutes are required to apply a complete set of shunts, if quick clearance is required it is perfectly safe to operate with only part of a set of shunts applied. Thus the line can be cleared for operation almost as quickly as the shorts and grounds can be removed. The advantage of using the preformed rods is obvious as compared with lowering the conductor to the ground, cutting out the defective splice, and replacing it with two new ones separated by a new piece of conductor.

Cleaning conductor with power brush is time-consuming operation in placing armor rods



Men work from platform on 85-ft ladder

Completing installation of shunt wires. Wires are preformed to fit snugly over old splice

Southern California Edison Co. is using an insulator-washer truck during its off-season for the installation. The truck has an 85-ft fire ladder, which will reach most of the splices to be treated. Two men do the work in the air, standing on either side of the ladder on a plank, as shown. They clean the black deposit from the conductor and remove the oxide by scrubbing the aluminum under petrolatum. The first shunt rod is centered on the splice and twisted onto the conductor on one side. It is then given a full 360° helix across the splice and applied to the conductor on the other side. The remaining 11 shunt rods are then singly applied to the conductor in a similar manner.

Preparing Conductor

Cleaning the conductor is the most time-consuming step in the process. Moving the truck and positioning the ladder takes about 10 minutes, applying the shunts takes 12 minutes, but cleaning the conductor by hand requires 30 minutes. Chemical cleaning is impractical, because of the uncertainty of removing residual corrosive chemicals that may seep into the inner layers of the tight conductor. Wire brushes powered by an electric drill driven by a portable generator cut the cleaning time to 15 minutes.

A group of brushes is mounted on the arbor and their diameters are stepped from 2 in. at the center of the group to 3 in. on the outsides. This results in a spool-shaped brush that contacts a considerable portion of the conductor's circumference and will not easily jump off the work. Because careless handling of the power brush can damage the aluminum, its use is restricted to that portion of the conductor lying more than one foot inside the ends of the shunt. The last foot at each end is carefully cleaned with a hand brush and the oxide film is removed full length by hand, scrubbing the aluminum, under petrolatum, with a wire brush.

Cleaning Important

Key to the conductivity of the shunt is, of course, in the cleaning of the conductor but the shunts are made long enough so that perfect cleaning is not necessary. Thus, tests have shown, with a moderately good cleaning, that the shunt easily improves the conductivity across the splice by 400%.

Fork lift truck stacks crossarms four tiers high (left). Right view shows how lift truck stacks material to conserve warehouse space

Stores Costs Cut by Modern Methods

First month's operation of fork lift truck showed saving of $732 in stores labor. Cost is $1.515 per hour or 11c per ton

Sherman R. Payne
Central Arizona Light & Power Co.
Phoenix

The Central Arizona Light & Power Co. stores operation in 1951 is quite different than that of five years ago. Because of rapid expansion of the company, stores operations and methods came in for their share of changes to cope with the situation. The company's first venture into improved materials handling became necessary when a large quantity of wire had to be moved from the third floor of an old warehouse to a location across the street. A Hyster "40" was rented. The utility furnished the operator, gas and oil. Results were astounding. A total of 11 tons per hour was moved 700 ft and stored, with the operation costing $77, operator's time not included.

Fork Lift Trucks

With such information available, management was convinced that the purchase of a fork truck for stores operations was in order. This truck, a Hyster "40," was received after the first of the year 1947, cost $3,100, and was put to use doing all the heavy lifting and moving. The first month's operation showed a $732 saving in labor on the stores' report. Based on these figures, the fork truck would be completely amortized in less than five months. Thus, a large labor force was released to perform other more important duties.

A venture into palletizing supplies was then started. The first pallets were made from salvage lumber from packing boxes, transformer crates, etc. This method was used so that the best type and size for the purpose could be determined. It was finally decided to make 36x60x4-in. 2-way-entry pallets the standard for outside operations and 40x48x4-in. 4-way pallets for inside use. An initial supply of 300 was made by the company's carpenter shop.

In January 1949 another Hyster "40" was purchased for the stores department, thus increasing the scope of operations, such as loading transformers, oil circuit breakers and heavy equipment for other departments, and thereby increasing their operating efficiency.

When management decided to take over the stores building for offices, a new modern warehouse with 16,000 sq ft of floor space was constructed on the site of the pole yard, thus taking advantage of a railroad spur already constructed. This new warehouse, in contrast to the former three-story building, was on one level with ramps and large dock space. As the new building neared completion, plans were made for moving equipment and materials so as not to interrupt daily operations of other departments.

The "go" signal was given on a Monday in May 1949, with instructions that the old warehouse spaces had to be vacated not later than 4:30 p.m. the following Friday. The move started, using two fork trucks and a crew of 12 men to supplement the small stores crew. During this moving operation the department continued to issue materials and supplies as

Storeroom is planned so that fast moving items are placed closest to issuing number

requisitioned. On Tuesday a Hyster "150" was turned over to the department, which enabled moving steel bins in units and handling larger loads of material. As steel bins were brought to the new building, each was placed in a spot previously marked out for them. Materials were placed into the same bins that they occupied before the move. The moving cleared all materials and equipment from three floors, an area of 42,000 sq ft, to the new building and storage yard in 39½ working hours. The move was made with all safety measures taken and was completed without an accident of any kind.

New Stores Procedure

Following the move to new quarters, a program was devised whereby the fast-moving classes of material would be located directly at the rear of the issuing counter, with a surplus feeder area directly at the rear of the steel bins. With such an arrangement the warehouseman would have to walk a maximum total of 80 ft to obtain the required materials. It was decided that the materials would be stored in alphabetical order in each class with new item numbers being assigned and a space allowed for future items. A new bin card was devised and made in two colors, white and blue. The white card is the original, the blue the duplicate. These are placed in card holders to identify the material stored.

The white card, used by the department for ordering purposes, has a minimum ordering point indicated. As material reaches the ordering point the warehouseman will pull the white card and indicate on the back the date, quantity on hand, and initial. This card is then placed in a file for pickup by the stores accounting department. The blue card remains on the bin for identification and also indicates that material is on order.

Bin Card

The white card, when picked up by stores accounting, is checked and forwarded to the purchasing department for ordering. When ordering date has been entered on repeat requisition and returned to stores accounting, the necessary data are then placed on the back of bin card. The card is then sent to the receiving department of the stores section and placed in a file by class. When the material is delivered by the supplier, the bin card is checked and placed with the material. When a warehouseman puts the supplies into the bins he replaces the white card in its original location.

Along with other improvements required to improve service, a location system for the warehouse and storage yard was set up. A Remington-Rand interlocking tube rotary file and chaindex file were purchased. The rotary interlocking tube file has all items shown by class in alphabetical and numerical sequence with the location indicated. The chaindex file contains all materials listed alphabetically, irrespective of class. Thus, if a person knows the correct catalog description of the material, he can find class and item and, with this information, can go to the rotary file and determine location. By using a map of the warehouse and storage yard, it is easy to find the item required.

Electric Fork Truck

Last February a Clark electric fork truck was purchased complete with charger, etc., for use by the stores department. The addition of this equipment has greatly increased the efficiency of the department. This truck can be used outside the storage yard as well as inside the warehouse and has ample battery capacity for a maximum day's operation. To date, maintenance has been confined to lubrication, cleaning truck, and cleaning and watering battery. In checking a daily operating report for an eight-hour period, 220,000 lb of materials and supplies were handled over a total distance of 3,000 ft. For this job the total operating cost of the electric fork truck, including depreciation, was shown to be $1.515 per hour or slightly over 11c per ton handled.

Since operations are so diversified, the men in the stores department have devised many ways to make the operation safe as well as to increase the efficiency.

Lift Truck Accessories

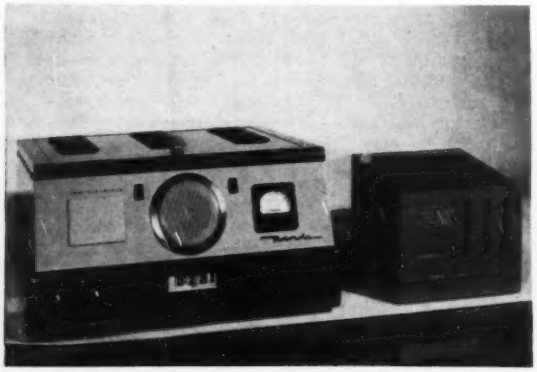
As an example, a special clamp was developed to be used with the boom on the fork truck for handling 600-lb barrels of pipe-coating enamel. By using a magnesium dock board it is possible to go into a car, pick up, transport, and place in storage approximately 12 tons per hour of this enamel. On this improved operation three men and a fork truck are being used. Before it required six men, a truck and driver, and a good day's work to lay 10 tons out on the ground.

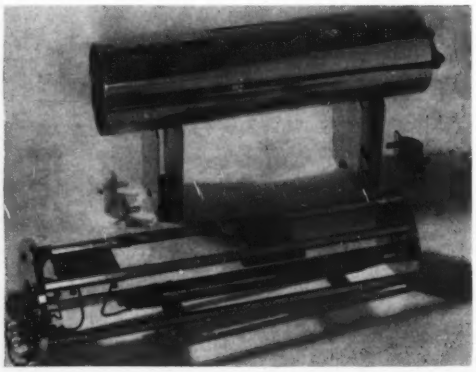
The present stores operation, covering a general warehouse, storage yard, pole and pipe yard, is manned by a total personnel of 12 men that includes supervision, warehousemen and clerical help. All stations in the stores department are worked on a rotation basis so that every man in the department will have full knowledge of the other man's job. With such a plan approved by management and each man working and cooperating toward the improvement of materials handling, further increased efficiency of operation is expected.

Repeater station for receiving signals from several radioactive snow-gage stations and sending them on to the recording station

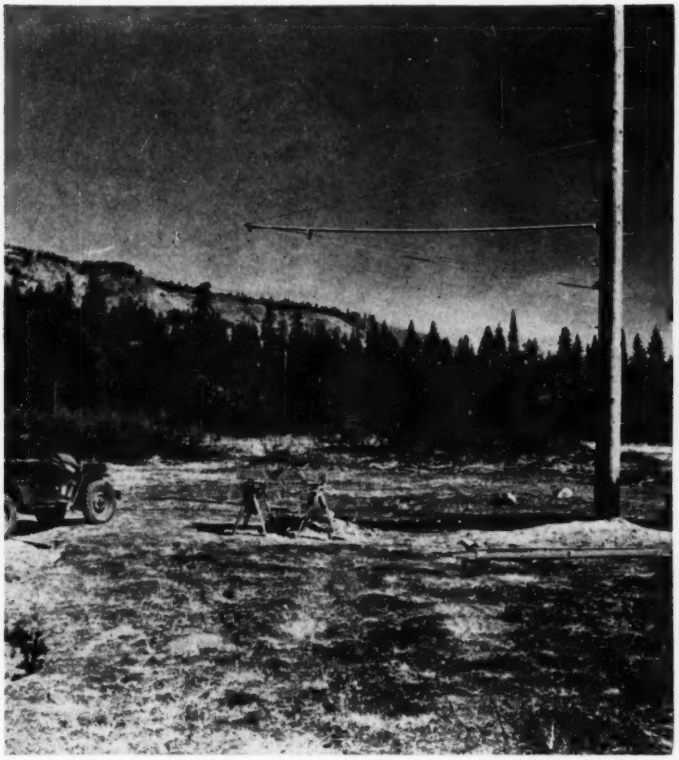
Isotopes Used to Measure Snow Depth

Supervisory control, telemetering and 2-way FM radio equipment automatically transmit and record snow-depth measurements



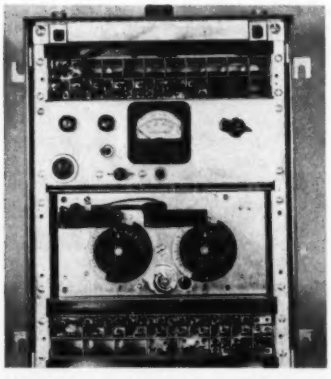


Receiver and scaler-divider unit (left) for indicating count from remote radioactive snow-gage stations. Right: Geiger-Mueller chassis



Pole and mast arm on which is mounted antenna and sensing unit of radioactive snow gage

One of the most recent applications of supervisory control and telemetering equipment is that of transmitting snow-depth measurements from mountain tops and other isolated points. From an economic standpoint, it is vitally important to use all the water from natural precipitation efficiency, particularly in the Western states. This requires accurate measurement of the moisture as it falls and as it is stored in the snow pack in the mountains. In the past this has been accomplished only by laborious sampling and an insufficient number of measurements.



½-w FM transmitter using cellular units

During the past two years, however, the U. S. Weather Bureau and the Corps of Engineers have developed a thickness gage using radioactive isotopes of common metals to measure the water equivalent of snow. Extensive tests have been made in the Sierra Nevada mountain range in California.

These artificial radioactive elements have recently become available in practical quantities as a result of the development work undertaken by the Atomic Energy Commission. The isotopes, like natural radioactive elements such as radium, may emit alpha, beta and gamma rays. Only the gamma rays appear to have sufficient energy to penetrate a deep snow pack.

The isotopes are planted beneath the ground surface. By measuring the intensity of the radiation of the isotopes after it has passed through the snow, the depth of the snow in terms of water equivalent can be determined.

The Geiger-Mueller tube was chosen as the sensing device to measure the radiation intensity because it is rugged and can withstand the conditions of operation imposed upon it. It is simple and provides an output that can be readily used in electronic circuits.

So that no one has to be present at the measurement point, usually in an isolated mountainside, Motorola 2-way FM radio equipment is used to transmit automatically the data to the central recording station. The battery-operated transmitters and receivers are mounted in small stainless-steel cases as shown, which themselves are weatherproof. Nickel-cadmium storage batteries were chosen to furnish power because of their excellent low-temperature characteristics.

In the radio units, individual sections such as oscillators, frequency dividers, transmitter and receiver stages, and the time switches, are individually removable for easy servicing in the field. This is the same principle of design as used in the "Handie-Talkie" portable radiophones.

From the data gathered and transmitted by this equipment, preparations can be made to store a portion of the water as it comes down from the mountains. Commitments to both hydroelectric power and irrigation water supplies can be made with full assurance of their fulfillment.

Isotopes for Pipeline Control

Another interesting application of isotopes used as radioactive tracers is that recently made by the Standard Oil Co. to its new Utah-Pasco, Wash., pipe line. Radioactive tracers in the line are used in conjunction with a Geiger-Mueller tube to warn operators of a change in the type of commodity being transmitted.

Whenever there is a change made in type of product being transmitted, the radioactive tracer is placed in the line at the sending end to indicate this change. The Geiger-Mueller tube picks up a signal when these tracers come along and actuates an indicator so that the operator may manipulate valves and pumps to dispatch the product to the proper tank or line. At booster stations along the line the tracer is used as the actuating signal for automatic pump operation.

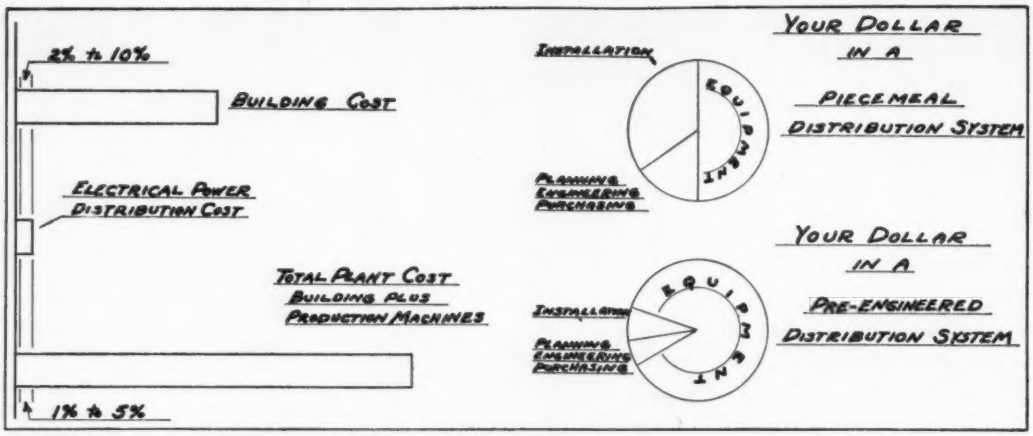
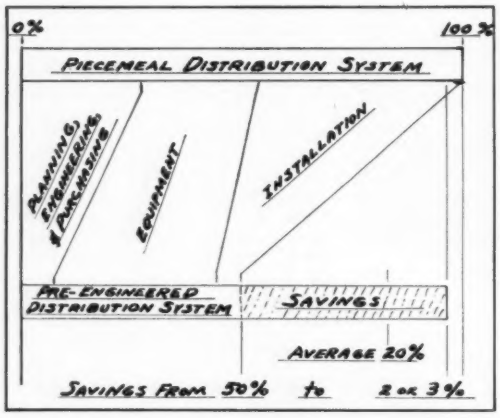


Fig. 1 (left)—Relation of electrical to total plant cost. Fig. 2 (right)—Cost difference between piecemeal and pre-engineered job



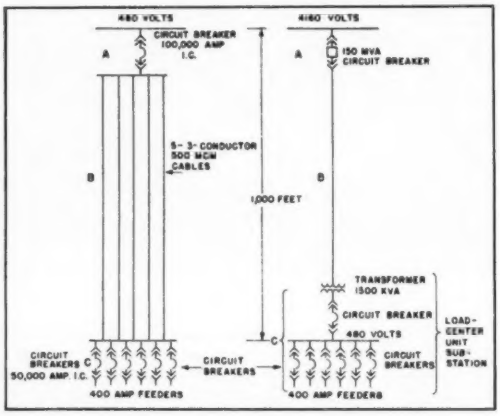


Fig. 3 (left)—Breakdown of savings made with pre-engineered system. Fig. 4 (right)—Systems for serving industrial load of 1,500 hp

PACKAGED OR PIECEMEAL?

Unitized industrial distribution systems can save up to 50% compared with assembling miscellaneous component parts

R. L. Gooch
Application Engineer, General Electric Co.
San Francisco

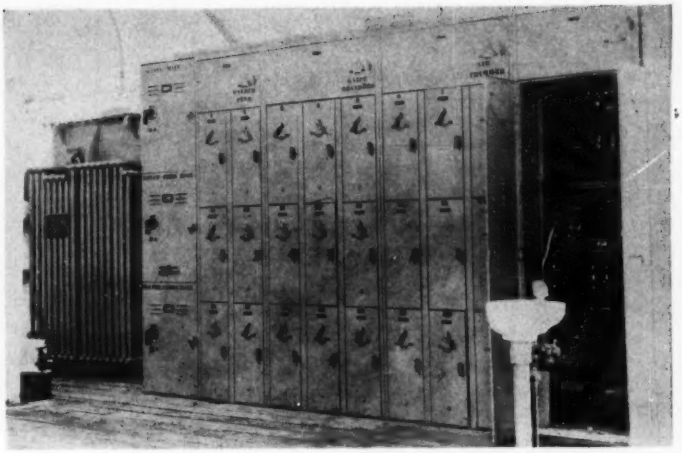
The electrical system in a lumber mill or other industrial plant is the vital link between the source of electrical power and the production machines. If the feeder cable to the headsaw motor in a sawmill fails, production stops and profits are curtailed. Loss of power can be just as deadly as running out of logs. So much can be had for so little from an industrial plant power distribution system that the operator can afford the best. A good power distribution system in a lumber mill is inexpensive insurance against loss of production and loss of profits.

How much is spent for the distribution system? Generally, the power distribution cost is less than 2% and not over 10% of the building investment—and less than 1% and not over 5% of the total mill cost including production machines. (See Fig. 1.) The expenditure made on a power distribution system for a mill is admittedly a small part of the over-all investment, but it is important that the best way be found to spend these dollars so that the most advantages and the greatest insurance of continuous production are obtained.

Before much engineering design attention was given to power distribution within the mill or factory, it was customary to purchase the necessary switches, starters, breakers and other

components by individual catalog numbers or specifications. That is, the distribution was simply an assembly of a number of components. It was necessary to do the purchasing on a piecemeal basis. There was no other way to do it.

Engineers have given a great deal of attention in recent years to the problem of power distribution to the various motors in a mill and to providing proper circuit and machine protection. Their efforts have been directed toward simplifying procurement, reducing installed cost, realizing higher levels of performance and reducing maintenance costs. In other words, the engineer wanted to be sure that the comparatively few dollars spent on the power distribution system purchased the maximum protection for the much larger investment in mill buildings and production machinery and gave the greatest guarantee of continuous and profitable production.



300-kva load center unit in lumber mill. Thymotrol at far right is part of G-E Cabinetrol

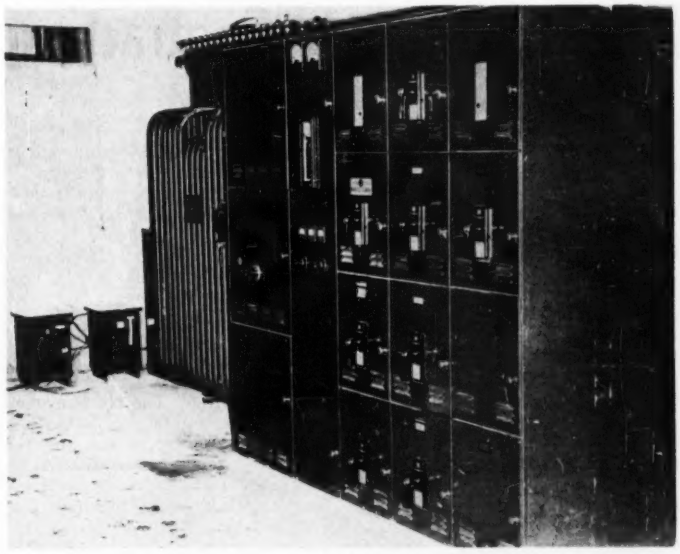
Unitized Equipment

Efforts of the engineer have been successful, and as a result, there has been a trend away from the old-style, piecemeal system, and a strong move toward the pre-engineered metal-enclosed distribution centers. Because of the excellent performance of the modern distribution equipment and its growing popularity among mill and factory owners it has become possible to standardize and mass produce, and thus greatly to reduce planning, purchasing, installation and maintenance costs.

The largest part of the dollar spent on modern power distribution equipment goes into the quality and dependability of the system where it can give the greatest advantages. (See Fig. 2.)

Furthermore, not only is more of the distribution dollar spent where it will produce the greatest benefits, but the cost of planning, purchasing and installation has been so greatly reduced that the over-all installed cost of the modern equipment is generally less than the installed cost of the piecemeal system. The savings made possible by the modern equipment on an installed cost basis run from a few per cent to as much as 50%, with about 25% being the average savings. (See Fig. 3.)

The chart in Fig. 3 attempts to show how cost reduction in planning, purchasing and installation can give the operator as much as 50% over-all saving while at the same time allowing him to put a larger part of each dollar spent into safer and more dependable equipment. In Fig. 4 a load of 1,500 hp is to be carried 1,000 ft and then distributed at 480 v. The system on the left assumes 480-v distribution throughout. The system on the right shows service at a higher voltage, 4,160 v, and the use of a load center unit substation with metal enclosed 480-v switchgear located near the center of load utilization. This is one of the most difficult cases to prove because of the necessity of transformers in the load-center system, while they are not required in the system on the left. The load-center system costs $30,000 or approximately $20 per horsepower on an installed basis, while the system on the left costs $42,500 or approximately $28 per horsepower on an installed basis. The saving is more than 25% in favor of using the higher distribution system with load centers.



One of eight 1,000-kva unit subs with draw-out air breakers at new Weyerhaeuser mill

Pre-engineered metal-enclosed equipment is rapidly becoming popular in the lumber and other West Coast industries. The accompanying photographs show recent installations in the lumber industry of the West.

San Diego contractor-distributor panel answers the question—

How to Promote Contracting

If you were to set up a promotion program for contractors and wiring, how would you go about it? It is a question that has perplexed many. Often the efforts have not been too successful nor have they received much enthusiastic support from the contractors.

By using some of the technique so resultful to the appliance business, the Bureau of Home Appliances of San Diego County, through its Contractors' Division, launched such a program at a kickoff dinner, Dec. 5. Some 200, mostly contractors from all parts of the county, attended and participated. A temporary executive committee of contractors and wholesalers outlined the plan in brief talks and a question and answer panel. All branches of the industry declared their interdependence with contractors and wiring and pledged full support. Already the advertising program has started. A director of this activity has been assigned full-time responsibility to it. A show of industrial, commercial and residential wiring and equipment will be featured along with the spring show of the bureau, April 16. Here are some details:

E. C. Phillips, Coast Electric Co., a supplies distributor, was chairman of the meeting. H. G. Dillin, vice-president in charge of sales, San Diego Gas & Electric Co., pledged utility support. He reviewed the company's record of growth in customers, its interest in adequate wiring as a means to serve its customers with more electricity. What is needed for an activity on wiring of all kinds is the same as that for any other business. It takes advertising, sales training, information to help sell, guidance in a coordinated program and a sales force. After conferences with NECA contractors and bureau contractor members, it had been decided to work through the framework of the bureau. This would mean less overhead and give the program the impetus of the bureau's prestige. The company had set aside a substantial advertising budget to promote wiring and the contractors through bureau advertising. Other facilities of the company would be channeled through the bureau to assist.

The latter, said Dillin, meant that Walter Chapman, commercial manager, Ed Meise, domestic sales manager, Bill McKinley, adequate wiring director, Al McCutcheon, domestic lighting director, Carleton Thompson, commercial lighting sales director, Percy Pine, power sales director, and Fred Edwards, line extension director, would work closely with the contractors' division.

J. Clark Chamberlain, manager of the bureau, explained that the contractors' division had not held a meeting for almost a year but in the past had done some good, mostly in domestic wiring. The 39 members were contractors who had some tie with the appliance business. But what was needed was a program to also do something tangible for the commercial and industrial and lighting contracting business. San Diego's six supply distributors were willing to contribute both time and money if the right combination could be found.

An organization committee had been meeting faithfully for weeks to work out a program. It was representative of the contractors in the northern, eastern, southern and central sections of the county. He introduced them: Joe Burkhart, Chula Vista Electric Co.; Al Meyers, Al Meyers Electric, San Diego; Neville Baker, Escondido; Charles Jobes, Helix Electric, La Mesa; Oscar Lundberg, Capitol Electric, San Diego; Jess Zweiner, San Diego; Bill Frank, Encanto Electric; H. G. Dillin, San Diego Gas & Electric; D. C. Bertrand, General Electric Supply; Bob Redfield, Graybar; Ralph Rhorbach, Pacific Wholesale; E. C. Phillips, Coast Electric; W. W. Powell, Western States Electric Supply; Bud Delano, Electric Supplies Distributing.

To answer the most often asked questions regarding the program the above named committee was seated on the stage as a panel and Ralph Rhorbach acted as moderator, putting the questions to the group for opinions and answers. These questions and answers described the program and policy concisely and completely.

Questions and Their Answers

Q—How will this program help develop cooperation?

A—By developing acquaintance. "Unfamiliarity breeds contempt." It will develop thinking about the whole industry. By not talking cost the emphasis will be away from comparisons and directed on business improve-

ment. It will create trust and getting to know each other will develop liking each other.

Q—What is the point in trying to sell bigger and better wiring jobs at a time like this?

A—It is true materials are scarce and restricted. However advertising is always needed. Meeting and talking will bring out what *can* be sold and when everything is again available the group will be prepared to sell efficiently. No business can wait for things to get plentiful. It takes months to build a program. A long-range program is needed. The electrical contractor's importance needs to be sold to the building public. As long as it is not all-out war there is still going to be lots of building. A contractor's salvation lies in being able to sell plus items.

Q—How does this program differ from previous programs?

A—While the previous programs have been successful and aided in residential wiring, this one covers commercial and industrial as well. It will have a full-time director to carry out the ideas and policies of an active executive committee, half of whom are contractors.

Q—Does the power company push gas instead of electricity?

A—Dillon answered that the utility's basic policy was to render the service the customer wants, regardless of whether it is gas or electric. Naturally it must devote its efforts to what will promote the best net revenue. In San Diego itself, he explained it did not actively promote electric ranges but, where a customer wants one, it serves it. To do so it is required to ask some questions in order to see if its street facilities are adequate. These questions are not meant to discourage or block the sale and use, only to determine the load and to build for it.

Q—What about advertising for the program?

A—The advertising department of the power company and a budget for this program are at the disposal of the contractors' division. An advertising committee will be organized to decide what kind of ads to run and where. Ideas from all contractors are invited. First ads had already appeared the previous Sunday. Contractors will be informed of the ad schedule and can put their own ads in with the bureau ad. It will carry more weight there. The ads will set up the contractor as the main man in the picture to reach the customer. When ads are run, they will be large sized, and contractors should clip and put them in their windows to draw public attention to them as the ones being talked about.

Q—How will the contractors benefit financially?

A—It is going to mean better and bigger wiring jobs. Often now the electrical is the smallest item on the building budget. This program should raise the standards wanted by the public. In other ways it will benefit too. Meetings will explore questions as to service requirements, shortages and materials, regulations and restrictions, and thus save the contractors both time and money through better knowledge.

Jess Zweiner, pioneer San Diego contractor and long active in the bureau's contracting division, summed it all up by saying that there is money to be made in the electrical contracting business when the business is on a selling basis. He termed the new program a challenge that all contractors should accept.

Carleton Bunce, who has been assigned to the bureau as the director and coordinator of the new program, told what he plans to do. He will call on all contractors and supply distributors and manufacturers. He will make talks before business groups on wiring and the importance of the electrical contractor. Sales training classes will soon be begun under Dan Turner. Educational and sales meetings will be held. Manufacturers will help with their product promotion. A bulletin will be issued on this program.

Promise of a big part in the spring annual show of the bureau, April 16, in Balboa Park, was given by J. Clark Chamberlain in closing the meeting. Last year a card-table exhibition of wiring materials and devices was a big success. At the spring show one entire building will be devoted to lighting and wiring exhibits, not only for residential but for commercial and industrial applications, and special efforts will be directed to bring to it the industrial and commercial executives of the community. It will also be a fine opportunity for the 1,000 or more employees of the contractors and wholesalers to see these materials in reality, not from a catalog page alone. Contractors will be spotlighted in the show's publicity at every opportunity.

The contractor, said Phillips in closing the extraordinary meeting, will have more attention directed toward him than ever before.

Whether a contractor-dealer can sell electric kitchens to tract home builders is answered by A. P. Masser, owner of Thompson Electric Co., Walnut Creek, Calif., who is doing it. He is wiring the 234 moderately priced homes in Manor Crest Village in Concord for Builder McKie W. Roth and Kenneth Richardson, realtor. He sold them the idea of making 50 electric kitchens equipped with Westinghouse range, refrigerator, automatic washer and dryer, included in the mortgage, to sell at $8,730 and $9,416. In the pictures are: J. G. McKinley, Westinghouse, Roth, Masser, and George W. Schutz, PG and E, being shown the circuit breaker panel in the garage by Andy Masser. The load center is located in the garage of each house

Fluorescent Lamp Ballasts

Theory and advantages of the newer sequence start ballast are discussed. Helpful hints are given for maintenance

A. B. Smedley

Consulting Engineer, Pasadena, Calif.

Maintenance of and additions to fluorescent lighting must conserve critical materials. Thoughtful planning for the replacement of ballasts and lamps can save quantities of copper, iron, tungsten and kilowatts. These are the possibilities afforded by new design in ballasts.

Since 1945, the instant-start ballast has come into wide use for all types of fluorescent lamps, both in new equipment and for replacement in existing fixtures. This development followed the precedent established a few years earlier by ballast-operated cold-cathode lamps. These, of course, were inherently instant start and their electrodes were not harmed by numerous instant starts. But there were problems, instant starting of hot-cathode lamps "cold" was rough on the coated hot-cathode filaments. Moreover, the increased starting voltage ratio to operating voltage, necessary for instant start, increased the ballast losses. However, the consequent elimination of the starters and their complicated circuits made maintenance easier and the lamps lighted instantly. The beating that lamp life was taking was overcome by reinforcement of the hot-cathode filaments and by increasing the burning hours per start whenever possible. Thus instant start was an important advancement but the reduction in efficiency still remained to be weighed against the improvements of instant start.

It was not until the development of the new sequence-start ballasts that instant-start operation could recapture high efficiency, previously obtainable only in the starter-type fluorescents. Inherent in this new sequence-start ballast came not only power saving but sizable reduction in the copper and iron requirements as well as many incidental improvements that will be enumerated later.

Development of the sequence-start ballast followed closely on the heels of a ballast first introduced for the operation of 8-ft cold-cathode lamps in series and in pairs. That ballast employed a series resonant two-lamp secondary circuit that operated at near unity power factor (99% plus). This ballast had the increased efficiency and, after a fashion, was sequence starting. Now all of the three basic types of sequence-start ballasts for both hot- and cold-cathode lamps make use of the same fundamental economy that every maintenance engineer exercises when he chooses higher voltage for power circuits to increase efficiency and reduce copper sizes.

In effect two lamps are operated in series in every type of sequence-start ballast. Certain auxiliary circuits are built in to impress the greater part of the lamp circuit voltage across one lamp first. After that lamp has struck, starting voltage is then applied across the second lamp. After the second lamp strikes, the auxiliary circuits are inactive and are not included in the power circuit of the two lamps in series. This starting sequence makes it unnecessary to have secondary voltage equal to the sum of the starting voltage of the two lamps in series. Thus the ballast gains not only in the economy of series operation but also in the reduction of the ratio of the starting voltage to the operating voltage of the ballast secondary. Filament lamp life is no different on some types of sequence-start ballasts than on instant-start ballasts, but prompt replacement of dead lamps will help to save its associated lamp from damage. Maintenance should be more alert. The advantages, however, appear to far more than outweigh any disadvantages.

Three Basic Types

In the three basic types of sequence-start ballasts, which will be discussed in following paragraphs, practical application and connection is different from the instant-start type. In all sequence-start types it is necessary to return both the black and white primary leads to the related lamp at the disconnect socket end. This is necessary as will be seen in the internal circuit to energize the auxiliary circuits for sequence starts. Fig. 1 shows the conventional instant-start and the sequence-start ballast. This diagram may be used for replacement of instant start with sequence start.

While the three types of sequence-start ballasts are all similar on the outside they are entirely different on the inside. Each has its points and all are more efficient than the instant-start ballast. Because of the auxiliary circuits, all give about 2% less light output in the No. 2 lamp than in the No. 1 lamp. This, however, is much less disturbing than the differences that have been observed in many lead-lag ballasts with line voltages above and below rated voltage.

First Type

The first type of the three sequence-start ballasts is illustrated in Fig. 2. The upper sketch is the schematic basic diagram and the lower sketch is the actual circuit in the ballast modified to obtain return from the lamps to both primary leads of the disconnect sockets. This circuit employs a shunt impedance in its auxiliary circuit. At the instant of energizing, the voltage across L opposes P and S and impresses about 700 v across lamp 1, which operates momentarily at reduced current. Lamp 2 did not light because at that first instant there were only about 200 v across it. When current flows through lamp 1, a phase shift occurs so that the voltage then across L adds to P and S to apply about 680 v across lamp 2, which then lights and both lamps function at full current. L has become inactive under operating conditions. It could even be disconnected and both lamps would continue to function. The main series condenser C is for producing resonance and correcting power factor. R_d is a discharge resistor and is not an essential part of the circuit. Condenser C_r is for elimination of radio interference. With supply voltage between 90 and 130, the light output on lamp 1 will vary about 12% and on lamp 2 about 16%.

Second Type

The second type of the three sequence-start ballasts is illustrated in Fig. 3. The upper sketch is the schematic basic diagram and the lower sketch is the actual circuit in the ballast as modified to obtain return from the lamps to both primary leads at the disconnect sockets. This circuit employs a reasonably close-coupled

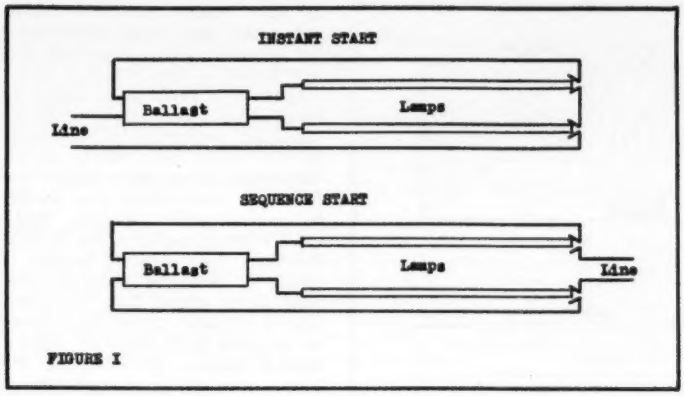


FIGURE I

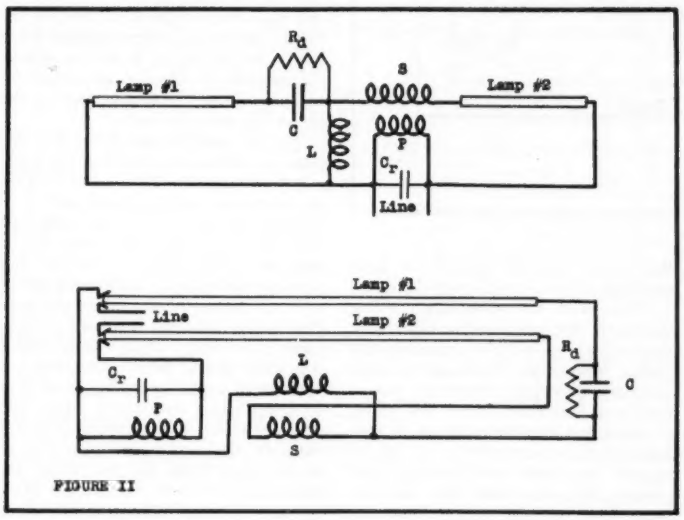


FIGURE II

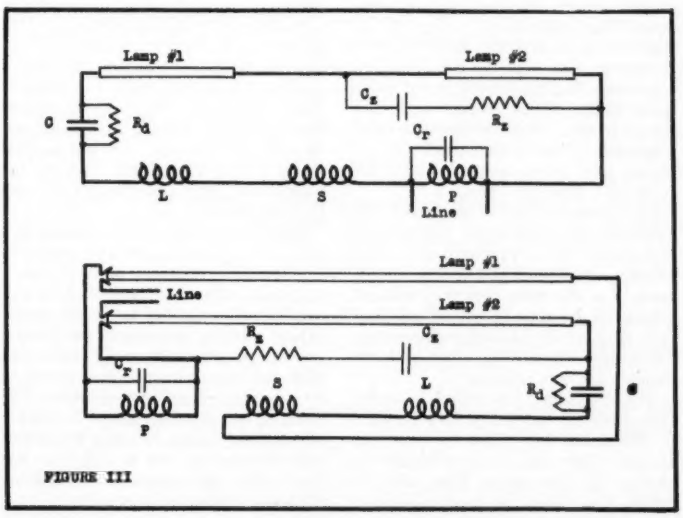


FIGURE III

autotransformer primary and secondary and a series ballast reactor (L) for arc stabilization. At the instant of energizing, a secondary voltage of about 700 is developed across the combined primary and secondary, which appears across the terminals of lamp 1. Lamp 2 is by-passed by C_x and R_x. At that moment, lamp 1 ignites and its voltage drops to about 280 at about 70 ma. Because of the voltage that then appears across the impedance circuit (C_x and R_x) and the energy stored in it, lamp 2 ignites. At that moment the combination of the lamp voltages is less than the voltage of the supply circuit and both lamps operate in series at their normal rated current. Once this condition prevails, the parallel impedance (C_x and R_x) becomes so great in comparison to the resistance of lamp 2 that there is only about 2% difference between the two lamps.

The main series condenser C is for resonance and power factor correction. R_d is a discharge resistor and is not an essential part of the circuit. Condenser C_r is for the elimination of radio interference. Between 90- and 130-v supply, the light output of lamp 1 will vary about 10% and on lamp 2 about 9%.

Third Type

The third type is illustrated in Fig. 4. The upper sketch is the schematic basic diagram and the lower is the actual circuit used in the ballast as modified to obtain return from the lamps to both primary leads at the disconnect sockets. This circuit uses a loosely coupled primary and secondary autotransformer that has inherent ballasting to stabilize the arc in the two lamps. It functions much like the second type just described. The open-circuit voltage applied across lamp 1 is about 700 v at the instant the circuit is energized. Lamp 1 promptly ignites and with a current of about 70 ma the voltage across lamp 1 drops to about 280 v. At that instant the voltage rise across C_x and R_x plus the stored energy in this circuit causes lamp 2 to ionize and ignite. At that moment the sum of the voltages across the two lamps is less than the voltage supplied to them and these lamps promptly begin to operate in series at their normal current. Again the impedance of C_x and R_x across lamp 2 is so high compared to the resistance of that lamp that there is only about 2% difference between the two lamps.

The main series condenser C is for resonance and power factor correction. R_d is a discharge resistor and

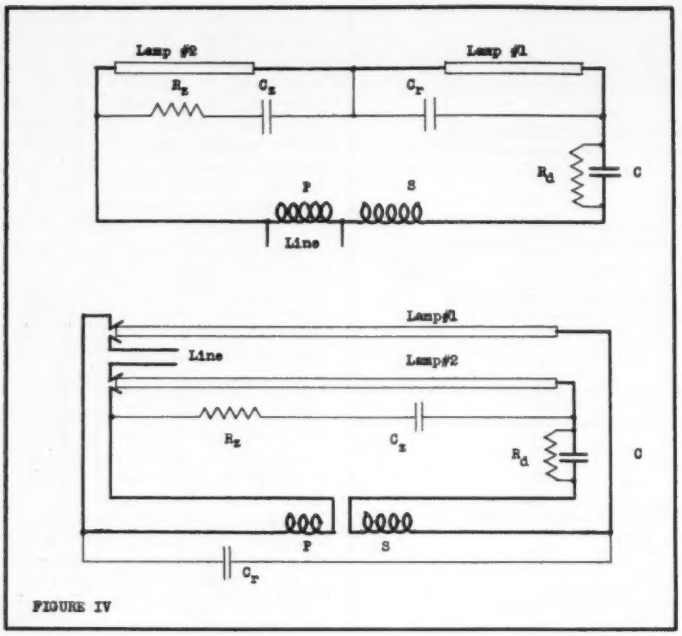


FIGURE IV

is not an essential part of the circuit. Condenser C_r is for damping out possible radio interference. For supply voltages between 90 and 130, the light output of lamp 1 remains essentially constant and lamp 2 is also without variation although this lamp is about 2% lower in light output than lamp 1 in series with it.

Stroboscopic Effect

It would seem that the old scarehead of stroboscopic effect might be back again since lamps that operate in series, as with any sequence-start ballast, have no phase displacement. The lead-lag ballast was touted to be the remedy for "strobe" but now it is found by actual test that these new sequence-start ballasts are not one bit better or worse than the average lead-lag ballast. The proof, too, lies in the fact that sequence-start operation is being successfully used in textile weaving and other such operations that are known to be critically strobe sensitive.

A probable explanation for this lack of stroboscopic effect lies in the commonly used carry-over or long-lap phosphors. These have apparently been doing a much better job than was realized. This fact is borne out too because the strobe effect is more apparent in the colder whites and less noticeable in the warmer whites on any type of ballast. It is well known that these warmer phosphors have the best carry-over characteristics.

Thus, with the stroboscopic effect dismissed, the many advantages incident in the use of the sequence-start ballast beyond the fundamental conservation of copper, iron and power can be summarized. Since less power is consumed the temperature is lowered. That means less heat to be removed by air conditioning, and greater life expectancy for the ballasts. The reduced use of materials means lower cost and smaller ballasts. The mechanical design of all types of sequence-start ballasts tends to reduce the noise levels. The few objections that have been heard about these ballasts have either been discussed in this article or they are overwhelmed by the conservation of materials and other improvements afforded by sequence start.

No discussion of ballasts would be complete without some mention of fluorescent lamp maintenance. Here briefly are summarized a few suggestions. For the most part they are unrelated to the type of ballast and may well fit in with plønned maintenance. Cleaning will not be discussed, its benefits are too obvious.

When a lamp has failed in a fixture after all the lamps have burned a sufficiently long time to have noticeable light loss, it is advisable to change all the lamps. The salvaged lamps may then be used elsewhere in more readily accessible fixtures and where their light difference is not so noticeable as compared with new lamps.

Often it is advisable to change all lamps in an area or department after reasonable service has been rendered. In any event, there will be an accumulation of operable lamps that have been removed and may possibly be used at other locations. Sometimes among these lamps will be those that have been removed because of unsightly darkening, although their total light output has been only slightly impaired. These lamps should be set aside to be used for replacement in fixtures with louvers or diffusers where the lamp appearance is not noticeable. More important is the decision either to reuse or discard the larger number of lamps on hand from group replacement. A simple practical method of selective restocking by means of the ordinary foot-candle meter has been devised.

To test used lamps for light output, an ordinary direct-reading foot-candle meter may be used. The 2x2-in. type with the light cell on top is the best. Make up chart for each type and size and color of lamp to be checked. Then make a filter of any suitable white paper so that the meter will read 50 or higher when the window to the light cell is placed directly against the lamp being tested. As a reference guide take a reading for each lamp listed by testing each kind of lamp when new, after about 100 hours burning. Make several tests for each to eliminate error and to strike an average. Make the tests some distance away from the lamp ends. Then prepare a table of useful life foot-candle values by taking 75% of the new-lamp foot-candle readings. This allows for a depreciation of 25% in light output. Any lamp showing a reading below the useful life value is then discarded. Preserve the paper filter and keep it clean for future use. It may be necessary to use several filters to get good high readings for lamps that vary considerably in surface brightness.

After the table of standards has been set up and a record made of the filters, it remains only to check each burnable used lamp before discarding or returning to usable stock. When making measurements always stay away from the lamp ends and pick out representative test locations on slightly discolored lamps. The reuse of serviceable lamps to obtain all of their usable burning hours not only reduces the cost of light but has the added advantage of conserving strategic tungsten.

ELECTRICAL WEST Contractors' News Letter

QUICK NEWS ON TRENDS, LAWS, CODES, MATERIALS, EQUIPMENT, COSTS, WAGES, ETC.

The 1952 dollar

The poor old dollar "ain't going to be what it used to be," in 1952, that's one sure prediction. More wage hikes, which will mean higher material costs, higher freight rates, and more red tape for government, which means more bookkeeping costs, can't add up to anything else but. Those who must build, including Uncle Sam, aren't going to get much for their money. Another spiral of inflation is in the making. Being a political year government agencies are not apt to do much to stop it.

Doing their bit

San Francisco leads off again with its yielding to a No. 6 IBEW request for a 25c per hour raise for journeymen electricians, to $3 per hour. By straining the interpretation of the wage stabilization rule this just comes under the wire, it is thought. The decision is up to the WSB for approval. The San Mateo peninsula union is asking the same thing. By a clause in its contract the East Bay can ask for parity. Sacramento, Stockton and Fresno try to follow the Bay Area rate, so the merry-go-round is started again.

Throughout the West

Salt Lake City and Ogden unions 217 and 354 have asked for a raise of from $2.50 to $2.90, 10c a mile for travel, reduction of the center zone to 10 miles and other minor items. The NECA has asked that employers be defined as contractors with a place of business outside their home and not working themselves with the tools. The press is giving the industry some bad publicity over it. In Pocatello the indication was that $2.47½ per hour would be settled upon, with double time for work overtime at Arco and the same all over if a new base is set up by WSB, as the unions seem to think they can get.

and North too

In Seattle the union is asking for 12½c per hour vacation raise, which it considers exempt from the wage formula, plus a 7c pay raise, a total of 19c. Portland goes to $2.64 Jan. 1. Also asks WSB for 4½c more later.

Inflating the index

Cost of living index of U.S. Bureau of Labor statistics is highest it has ever reached, which is given as the reason for the wage demands, ignoring the fact that wage hikes will only reflect later in still higher cost of living. It is a refusal to buckle down to pay for the war and war preparation and accept a lesser standard of living.

Without producing

Trouble is wage increases are not made up for by increased productivity, which could compensate for some increase by holding the cost of producing level. Instead of that, along with increase demands, some union locals are trying to prohibit use of tools that would speed production. The powder-operated stud gun is an example. Despite improved design for safety, unions talk safety as an excuse for forbidding their use. What about electricity itself, must that be banned too because some careless workmen allow themselves to get shocks?

Backfield huddles

Both California Conference of NECA Chapters and Northwest Conference of NECA Chapters are to meet to take a look at the wage and other fringe demand situation, the material supply and the fading civilian construction picture. The California group meets in Los Angeles Jan. 26; the Northwest Feb. 1 in Seattle.

Spiked

The plumbers of northern California had agreed with their unions to a 7½c an hour welfare plan fund and had set up the machinery for its operation but the Wage Stabilization Board has turned it down.

Join forces

Vallejo electrical contractors have joined Northern California Chapter NECA for aid in labor relations and to get NECA services until such time as a Napa Valley chapter can be formed.

Father and son

John Maddox and his son Jack will soon announce a new agency setup as representatives for Ideal Industries in California. Georgia's favorite son is well known in lighting and manufacturers' rep. circles.

Old housing never dies

Ersatz comes home to roost for the Public Housing Administration. Its wartime housing was designed for temporary occupancy and was skimped in its wiring to a basis of about 500 w per dwelling unit. That meant an ice box, no appliances, just lights. But, instead of being torn down after the war, housing shortages keep them occupied. People insist on filling them with refrigerators, TV sets, washers, dryers. In San Diego's PHA Frontier Homes, all on master meter, the situation is especially critical, may require lots of rewiring.

Opening

National Bureau of Standards is looking for a chief for its shops division in Washington, D.C., to run its scientific shop with a crew of 200 scientific workers. Details available from its personnel division.

Old-timer outlawed

Per outlet pricing, that old bungalow wiring custom, is doomed by the new pricing regulation for contractors, CPR 93. That order, developed by the construction industry itself, through such associations as NECA, lists the various pricing methods common to the business but leaves out pricing per outlet, one of the oldest in the house wiring game. If a contractor used that method of pricing during the base period he has to go back to cost as he figured it to get his per outlet figure, determine his markup and then convert his new pricing on that, but he will have to abandon the per outlet basis. If that was a bad basis, that may be good, but was it? Time will tell.

Low roofs again

Low voltage (up to 300 v) service drop rules of the California Public Utilities Commission for industrial and commercial buildings have been amended (Rule 5418-B4 (a) of General Order 95). It calls for a vertical clearance of not less than 8 ft. over all portions of buildings, except that drops of 0-300 v may be less but not less than 12 in. above the cornice, decorative appendage, eave or roof. There are some qualifying requirements. California Safety Orders automatically make the PUC rules a part of their own.

Expand in North

Square D Co. has bought a lot at Corwin Place and Poplar St. in Seattle on which to build a manufacturing plant and office for the Northwest. It will have 52,000 sq ft compared to its present 8,000 at 1409 Dearborn. Ernie Walton will manage the new plant. Square D president F. W. Magin said it was company policy to erect medium-sized plants in different strategic areas.

Housing shortage

Critical housing ratings were announced by DPA in the Contra Costa County, Antioch, Concord and Pittsburg area; the Pleasanton, Hayward, Livermore San Leandro; the Monterey, Carmel, Pacific Grove, Salinas, Hollister, Watsonville; the Ventura, Oxnard, Port Hueneme areas. Suspension of housing credit and critical materials restrictions will be permitted to get some needed housing units built.

Ease on materials

CMPR 5 and 7 have been eased to permit manufacturers and repairmen to obtain an increased amount of materials for installation of industrial equipment and household appliances. Allows a manufacturer a $1,000 quarterly expenditure for minor capital additions plus a similar amount for MRO supplies. The changes to CMP 7 defines installers of domestic appliances as repairmen and gives them priority help in getting materials for such work.

Chapter news

H. E. Anderson has been appointed chapter manager for the Central Valley Chapter, NECA, at Modesto. Anderson is also the local Builders Exchange manager. And San Joaquin Chapter, at Stockton, has reduced its dues to 1% of labor pay roll. The Los Angeles Chapter is starting its educational program at UCLA in January; and is endeavoring to bring Riverside and San Bernardino contractors together to form a division, the way Orange County contractors have.

Simplify the bid

A practical Home Wiring Estimator has just been developed by Westinghouse Electric Corp. It ingeniously combines in one sheet a step-by-step listing of the branch circuit requirements and the data by which to calculate load, feeder sizes, loadcenter arrangement, and location and kind of outlets. The sheets are bound in a booklet of 25 sheets for 25c. Each is perforated to tear out the estimate sheet, leaving a cost record in the book. A direction to use sheet and one specimen estimate is included. The shees are based on good engineered wiring. By listing the major appliances to be provided for, their use should enable a contractor to really sell his estimate on a basis that should be profitable.

More news

Beginning with this January issue, to serve our constantly increasing electrical contractor readership with more information, this news letter is being expanded to four pages.

Need to train more manpower

National Industrial Service Assn., the motor shop association, has arranged with International Correspondence Schools for a special course for motor shop apprentices at a special rate. The course is a 37 unit one. NISA's annual contest for shop ideas is on too. It closes for entries on March 15; offers 14 prizes totaling $350.

One more price to regulate

Motor shops now have one more pricing regulation they come under. CPR 105 affects the pricing of second-hand and rebuilt motors and electrical equipment. It sets the percentage of published price a motor may be resold at second hand. It requires that with each sale a complete invoice and description of the equipment, including its age and the base price, be given the customer and copies kept for two years. Other OPS orders that motor shops come under are CPR 34—services; CPR 67—sale of new equipment; CPR 93—installation of wiring or equipment and now CPR 105—sale of used equipment. Those doing business with coal mines are told by NISA that coal mines have a special MRO under M-87 and use the symbols H-8 or DO-H-8.

No escape

Even if you sell your business these days you are under obligation to follow NPA Reg. 6 as to quotas, ratings, etc, that can be transferred to the buyer.

Planned theme

Planned Productive Maintenance will be the theme of both the show and the technical conference being prepared by the Electrical Maintenance Engineers of Southern California, to be held at Culver City Veteran's Auditorium, March 20-22. The conference will be on Thursday afternoon and Friday, the show continuing through Saturday night. The program, under Leon Dame's programming, will cover planned lighting, equipment and plant electrical distribution maintenance. Dick Rodgers, Ace Night & Day Electric, is show chairman; Emerson Reichart, vice chairman; Hal Davis, assistant show director; Jack Cochran, exhibit chairman, and Jack Rohring, EMEA president, attendance and publicity.

See to work

General Electric's Lamp Division has published the first five of a series called "See Better-Work Better." These well-illustrated booklets show the best recommended practices for lighting various factory operations, including the special types for particular kinds of critical inspection. Copies are available from G-E Inquiry Bureau, Nela Park, Cleveland.

Contest

Sales managers of recognized electrical distributors handling home lighting fixtures are urged by the American Home Lighting Institute, the fixture manufacturers group, to enter a contest for which the prizes are expense-paid trips to the NAED convention in June at Atlantic City. The yardsticks are preparation of a sales training program, promotion and advertising and newspaper publicity, etc.

PECA elects

Arthur M. McLean of Walsh-McLean Electric, Portland, was elected president of the Pacific Electrical Contractors Assn. in that city. Don Calderwood was elected vice-president; Ed Jewett a new director in addition to William Tindula and Ken Allison, who continue on the board. Lloyd Franklin has been president during the past year.

Wiring under difficulties

Eighth National Adequate Wiring Conference will be held in Chicago at the Sherman hotel, Jan. 24 and 25, following the Home Builders convention. Because of the materials situation several important topics are scheduled, such as problems in possible use of aluminum wire, wiring under the CMP and similar problems. M. E. Mentzer, Rocky Mountain Electrical League, will be on the program.

Light ceiling

Plexiglas for Luminous Ceilings is the title of an attractive booklet now available from Rohm & Haas Co. plastics department. It lists the advantages, properties, recommended uses, lighting calculations, installation methods and methods of support and types of unit designs.

Speed service

Lighting panels in any combination immediately available from the distributors' shelves is what the new merchandising program of BullDog Electric Products Co. offers with distributors stocking P2B and P3B basic devices. With a cabinet, front and interior that is standard, Pushmatic breakers as required are inserted by the distributor.

Design training

A course in electrical drafting and design is being taught at Santa Ana Junior College by Jack MacFarlane, electrical engineer and contractor of that city. It was asked for jointly by the NECA contractors and the local union. MacFarlane's purpose is to help develop more journeymen into estimators and job engineers for the contractors.

New head

Puget Sound Chapter of IAEInspectors elected J. C. Hewitt, Washington State electrical inspector, its chairman for the new year at its Dec. 1 meeting at Everett. Megler Girard was elected vice-chairman, C. S. Alger remains secretary; J. H. Watt is treasurer and J. E. Hitch, James Fletcher and Ray Larrabee are on the executive committee.

Burst at the seams

In spite of all the restrictions put on in an effort to hold back house building to 850,000 units in the U.S. in 1951, more than a million units were built and though the rate has slowed down, there still seem to be so many people needing housing that the pressures are too great to hold down. The prospects for 1952 are not as bright, as the controls seem only to be beginning to be felt in many quarters.

Bigger operations

Sylvania Electric Products Inc. is building a big distribution center building at Spokane and East Marginal Way in Seattle. It will have 28,500 sq ft of floor space for offices and warehousing of lighting, radio, television and photographic lines. Charlie Dickinson, Pacific Northwest manager, says it will also be lighted in a fine way.

Pioneer passes

George Curtiss, for many years manufacturers' agent in the San Francisco Bay region and at one time secretary-manager of a pioneer radio association, died last month at his home in Oakland.

Supply merger

Marsh Electric Supply Co. of Long Beach, which had originally been the Williams & Clance Electric and was sold to Marsh in 1936, has now been bought by the Electric Supplies Distributing Co. of San Diego. Henry Williams, one of its founders, will remain with the firm.

Retain the crew

Los Angeles Chapter of NECA re-elected its officers at its annual meeting, Dec. 10. Sidney F. Hill is governor; Richard E. Arbogast, president; Herbert L. Evans, vice-president; A. L. Stone, treasurer; and in addition to the officers the directors are J. B. Shamel, Charles Wikle, E. L. Swearingen, Rand F. Doll, Julien Davis, Allen D. Fishbach and Lewis V. Barth. Two new directors were added. Warren Penn is executive vice-president and Jack Rollins his assistant.

A new look

A new mercury lamp with a better-balanced color by Westinghouse is getting fine acceptance. Westinghouse Lamp Division has available a booklet, giving technical data needed to design lighting installations using this J-H1 400-w lamp.

Retires to new job

Axel O. Olson, who for years was in charge of street lighting for the San Francisco department of Public Utilities and lately was manager and chief engineer for Hetch Hetchy Water Supply, retired in December. He will become affiliated with a national consulting engineering firm.

Aluminum for copper

Aluminum conductor in small sizes was recognized by Underwriters' Laboratories in 1946 but it was hard-drawn aluminum and it proved hard to pull around bends in conduit. Now after investigation a semiannealed aluminum of lesser tensile strength has been found to be flexible enough under field conditions and capable of withstanding the abuse encountered in normal installations in a manner equivalent to copper. So it is judged to be acceptable for use. You may look for more companies to bring forth aluminum conductor building wire soon. The copper supply situation is not only a result of the war preparedness situation—it is getting in truly short supply in this country.

Long needed changes

Standards for service equipment and for enclosed switches have been revised by the Underwriters' staff and Electrical Council after long study of the previous 1936 standards. Both now have enclosure requirements more nearly those of cabinets and boxes. Ratings are in multiples of 120 v instead of 115 v, and other details relating to horsepower ratings when time delay fuses are used, etc. are changed to fit the NECode.

Fast

T & B entrance caps on service entrance cable are an example of well-engineered design to save critical materials and do an improved job. They also save on time, which helps to compensate for increased labor costs.

ELECTRICAL WEST

Sales Guide

News Letter

FOR THE ELECTRICAL MERCHANT OF THE WEST

January 1952

©

Seasonal trend

Business in appliances, radio and TV made a final spurt in December up to Christmas and then took the usual seasonal dive. On the whole dealers reduced inventory and did pretty well for that month. But like the Stewart-Warner release story of the farmer who fed pigs all winter and then sold them but got no more than what they cost and the feed, he said he guessed he came out ahead. He'd had the company of the pigs all winter at no cost to himself.

Confusion is normal

Housewares stocks were more cleaned out than white goods, which sold not quite as well as in November. With new models coming out, under barrages of advertising, many manufacturers hope to keep January and February sales moving. The supply is spotty, some lines or models being on back order, others in good supply. The same goes for manufacturers. Some have plenty of materials, they say, others say they are held down by shortages. The outlook is what is now considered normal.

Predict on yourself

Although we have a crystal ball on the desk here all we can see in it is our own reflection. Perhaps that is significant. What will 1952 be? It will be a reflection of what we do to make it good or bad. There is a full supply of obstacles, some with entirely new angles. But when has merchandising ever been without problems? When have good merchants failed to take them as they came and still do business?

Legal

Radios may be a luxury, but washing machines are legally a necessity, a judge in Vancouver, B. C. ruled in a recent case.

Most colorful

More participation in outdoor Christmas tree decoration than for many years was reported by the Outdoor Christmas Tree Assn. of Calif. in summing up the contests held throughout northern California. Newspapers and civic organizations sponsored contests and entire neighborhoods went in for lighted decorations of trees, homes and gardens.

Crackdown

OPS has said that it is starting an enforcement survey of prices being charged in the service trades, among which are radio and TV service and electric appliance repair shops.

Goliath challenged

Sunbeam asked the Federal Court in San Francisco and got an injunction against the Payless drug stores in California, Oregon, Washington and Utah in a suit for $825,000 treble damages for selling Sunbeam appliances at below fair trade prices and charging that other dealers were induced to supply Payless by violating their contracts. The suit is comparable in importance to the Macy antitrust suit filed by Sunbeam.

TV tabloid

In spite of boom, bust and Korea the radio and TV industry did all right in 1951. It made and sold practically all of 5¼ million TV sets and 12½ million radios as against 1950's 7½ and 14.6 million, besides untotalled but about as big again a production of military electronic equipment, Glen McDaniel, president of RTMA, says. Similar year-end statements came from Ben Abrams, president of Emerson; Ross Siragusa of Admiral; David Sarnoff of RCA and others. . H. A. Bell, of Packard-Bell, reported a complete sellout of its 1951 sets. . Set production has now leveled to about 400,000 units a month and 1952 should produce between 4 and 5 million sets. However, the 3-year freeze on new TV stations is promised to be lifted in February, so the demand on production will be heavy. . UHF will probably be released first in now unserved markets. . Color will stay in the laboratories and not emerge in 1952 to plague sales. . Whether to make a play for keeping the old set as a second set or taking it in trade emerges as a problem as saturation nears 50% in TV areas. Picture tube replacements are bringing this into focus as people want bigger tube sizes. . John Meck, president of Scott, says radio and phonograph listening is increasing despite TV. A questionnaire to families in five cities, among them Portland, Denver and Tucson, shows that more than half will buy TV immediately after programs are available.

..continued

Skouras, president of National Theaters, wants to launch color TV on closed circuits to Fox West Coast theaters, using the Swiss Eidophor system, piping live shows from Hollywood. . H. C. Bonfig of Zenith told Los Angeles Sales Executives that NCAA will support subscription TV like Phonevision. . RTMA is going to continue an active program of cooperation with baseball and other sports. Distributor who has accepted chairmanship of local sports committee is E. Zerega, Zerega Distributing Co., Seattle. . Willamette-land TV Corp. of Salem, Oregon has petitioned FCC for a channel for Salem. . Irving Crown of Jack's Appliance Store in Cheyenne has been previewing TV from as far as Atlanta for local people, whetting their appetites. . In Denver the CBS station KLZ has been getting its advertisers ready for TV by a series of clinics addressed by big-name experts. . Sarnoff of RCA declared TV revenue had surpassed network radio revenue for the first time in 1951.

New models

Majestic will not introduce any new models at Chicago market, said Leonard Ashbach, but will concentrate on models that have shown public preference. . Bendix held a distributors meeting at the Chicago market time to launch new sales programs and show new models. . Magnavox announced price adjustments effective Jan. 1 on 20-in. consoles, drops of from $20 to $50. . Motorola has reduced prices from $30 to $125 because of a simplified chassis on 19 new TV receivers. Among them is a portable in leatherette finish for $199.95. . Emerson has two new models, a 17-in. and a 20-in. designed for fringe reception. . Admiral brought out a new 17-in. TV-radio-phono combination at $449.95 as a midwinter promotional item. . Sparton introduced a new line at the Chicago show, featuring the 26-tube chassis. . Scott replaced 1951 models of its 17-in. open console and table set with new 1952 models of the Ravenswood. . Tele-King offers its chassis in Western cabinets in six new 24-in. models.

Servicing

Television Interference, a collection of articles by Phillip Rand of Remington Rand laboratory of advanced research that any serious service department supervisor should have. . RTMA told the American Vocational Assn. convention the need for training more TV service personnel. RCA is preparing for RTMA a 3-year course for vocational high schools. . Old straight filament lamps cause TVI.

General Electric Co. is suing A&S Appliance and vacuum cleaner stores in Los Angeles for alleged use of an offer of a Premier Vac-Kit, no longer manufactured, as a come-on and switch gimmick to obtain prospects and pressure into other sales, to the detriment of the G-E name. — Defamed

Philco has established a factory branch, known as Philco Los Angeles, a division of Philco Distributors Inc. Phil Gough of Gough Industries, which has handled the Philco line for years, will be temporary president. The announcement was made at a gala Christmas party given by Gough for 3,000 dealers and their families. John M. Otter, vp and gam of Philco, presented Gough a scroll and a gift. After the change is completed it was said that Gough Industries would be open for some other line. — Philco on its own

Distributor changes and appointments of recent weeks include: Arthur C. Maryon Co. becomes northern California distributor for Raytheon TV and Radio. . Capitol Wholesale Electric Co. of Sacramento becomes Proctor distributor. . Clyde Allen Co., San Francisco Mart, has been appointed factory representative for the Dexter Co., which now has an automatic and a dryer as well as wringer and double tub models. Dexter distributors are Walz Co., El Paso and Phoenix; Harry L. Shane Inc., Los Angeles; J. J. Lukanish Co., San Francisco; Central Supply Co., Portland; Globe Electric, Seattle; Spokane Paper & Stationery, Spokane. Boyd Merrifield, former Cory man, has joined Allen and will return to Seattle to be Pacific Northwest representative. . Lee Distributing Co. of San Diego now handles DuMont TV. . Chicago Electric Co. has named Dave Sanford Co. representative in Los Angeles. . ZCMI in Salt Lake City becomes the Hoover distributor in the mountain region. . Ray Thomas Co. has been named Permutit water softener distributor in southern California. . Herbert Horn Inc. is now southern California distributor for Youngstown kitchen line, formerly handled by Gough Industries. . The Thomas Distributing Co. (not the same as above) is now distributor for Jud Whitehead water heaters and General Air Conditioning Corp. line of kitchen refrigerator-stove combinations. . Contractors Heating & Supply Co. of Denver is now distributor for Sub-Zero home and farm freezers and Ten-Ten upright freezers made by Manitowoc Equipt. Wks. . San Diego Imperial Supply Co. of El Cajon will be distributor for the Stewart-Warner TV and radio in San Diego area. . Tele-King Distributing Co. is also entering San Diego, with Bob Mosher in charge. — Names and lines

General Electric Credit Corp. has opened a Fresno office in the Rowell Building and Harry Gough, western manager, has appointed J. H. Seidl to manage the office. — Credit expansion

Oliver K. Hope, who retired once but came back into the appliance business and became buyer and manager of major appliances for Whitney's department store in San Diego and was responsible for the opening of the spectacular branch in the North Park district, died of heart ailment, aged 50, early in December. He was a director of the Bureau of Home Appliances. — Loss of a leader

H. R. Basford Co., Zenith and Whirlpool distributors in San Francisco, announced that William Mixer was named vice-president and general manager and J. T. Templeton is vice-president and assistant to the president, George Eggleson. George Dickie becomes general sales manager. — Promotion

The Railley Corp., originator and for years largest maker of Pin-it-up lamps now returns to active business with a new line of pin-it-up and table lamps. It is newly merged with Clasco Products Corp. — Back in

To be reorganized as a strictly promotional organization, it will now be the Inland Empire Electrical League in Spokane, instead of IEEDealers Assn., with wider membership scope and participation by all branches of the industry. The former IEEDA was a combination of trade association and promotional league but failed to receive broad support lest the trade association functions be entangling. Under the new program, details of which will be given later, as a league its efforts will be directed at market and sales promotion, campaigns, etc. V. E. McCain, Graybar, heads a new committee for reorganization.

Strictly selling

New products being announced by various makers include: A new high-speed self-defrosting system in its refrigerators by Kelvinator; and a new five-year warranty plan on its commercial sealed units. . A newly designed kitchen ventilating hood to fit standard kitchen cabinets is being made by Stanthony Corp. of Glendale. It has lights and switches and a blower if desired. . Fasco announces a five-year guarantee on six fans of its de luxe line. . Perfection Stove Co. is showing six new electric ranges at its sales conventions. Majestic Radio has a new Radalarm clock-radio in two models. . Thor is busy promoting its now fully automatic washer at $299.50. . Hotpoint is featuring two new electric ranges with lighted pushbutton controls and a clock timer. Hotpoint's dishwasher advancements include dishracks that will hold the largest standard dinner plates, a larger silverware container, a number of other detail refinements. . The newest thing in home lighting, the illuminated valance, is offered by Joleco Corp. of St. Louis. It has a fluorescent lamp, plywood valance that can be finished to match, curtain rods, complete. . Audar Inc. of Pasadena offers a wall shelf radio to hang on the wall. It contains small drawers, shelves in provincial style. . Apex is featuring a new Roll-A-Way Dish-A-Matic dishwasher, with a built in 4-gal water heating tank to provide 190° water rinse and a universal inlet hose that does not need to be fastened to the faucet during the cycle. . Appliance Mfg. Co. announces four new Duchess washers, one with an automatic electric timer and heat retaining jacket. . General Electric says its silverware container in automatic dishwashers is now being made of a G-E rubber-phenolic compound made by its chemical division. It eliminates scratching the silver.

New things

Mitchell Mfg. Co. is readying a big campaign for its 1952 line of room air conditioners. The line shown at Chicago recently has seven models with four different cooling capacities from 1/3 to one ton. Complete package of sales helps and advertising is available.

Ready for summer

Dates for merchandising events in the next few months include the Los Angeles Furniture Market, Jan. 28-Feb. 1; San Francisco's Western Winter Market, at the Mart, February 4-8 (the appliance and radio dinner is Wednesday night, February 6); 14th Winter Conference of the Bureau of Home Appliances of San Diego, February 14, and its Spring Fair of Modern Home Ideas, April 15-20.

Events

Robert M. Oliver has been named by the Westinghouse Electric Appliance Division to take on the job Sam Vining once had, that of merchandising counselor. He was with Westinghouse from 1936 to 1940, went to Proctor, and later Landers, Frary & Clark. He also had utility experience with Nebraska and Iowa utility companies.

Experienced

Harry Kaye, president of Kaye-Halbert Corp., has staffed with a number of former executives with other lines: John L. Lyons, general sales manager, from Horn; Spencer Glaspell from Packard-Bell; J. Grady Smith from Tele-King; Ray Hillebrand, Mayberg; George Grider, Horn; etc.

Recruits

Los Angeles Newspaper Publishers Assn. Standards for Television Advertising

Effective: Nov. 1, 1951

1. Model Number

The model number as designated by the manufacturer shall be stated.

2. Qualifying Phrases With Manufacturers' Names

When phrases such as "Dumont tube" or "RCA licensed" are used, the qualifying word or phrase, such as "tube" or "licensed," shall immediately follow the manufacturer's name in the same size type.

3. Advertising Price and Extra Equipment

(a) Advertising shall not represent or imply that the advertised price of a television set includes all equipment, accessories or service necessary for the set to operate when such is not a fact.

(b) When it is obligatory to purchase equipment, accessories or service along with the television set at the advertised price, it is necesssary to so state.

4. Misleading Claims

Such terms ". . . . . first with" or "only at . . . . ." shall not be used when the same merchandise at the same price is available at a competitor's store.

5. Trial Offers

(a) Trial offers shall be clearly stated to avoid misunderstanding as to their true meaning.

(b) A "Home Demonstration" in which a set is not left in the home for trial purposes without cost or obligation to buy shall not be described as a "Trial Offer."

6. Size of Picture Tube and Color

(a) The diameter of the circular tube or the longest dimension of the surface of a rectangular tube shall be given, i.e., 10 in., 12½ in., etc. Only such description of picture tube size shall be used. The number of square inches of viewing space may be stated providing the diameter of the tube, i.e., 10 in., 12½ in., etc., is also quoted in conjunction.

(b) Reference to or illustration of picture size of projection receivers shall make clear that the size is by projection.

(c) Advertising offering "Colorvision" or "Colorview," etc., shall not be used unless tubes contain electronic color scanning device. If the term "color" is used with reference to layers of cellophane or painted picture tubes, it must be clearly so stated.

7. Prices With Illustrations

(a) Prices quoted in conjunction with illustrations of cabinets or stands holding television sets shall state whether or not such cabinet or stand is available with the set at the advertised price. Such statement must be included in the descriptive copy in the same size type, accompanying the illustration.

(b) When a price is featured in advertising and one set is also featured, then the two shall refer to each other—featured price buys featured set.

8. Guarantees and Warranties

Any guarantee or warranty shall be clear and specific as to its full terms and conditions. An advertised guarantee shall be understood as the responsibility of, and to be fulfilled by, the advertiser unless otherwise qualified.

9. Trade-Ins and Down Payments

(a) Any trade-in allowance shall be an amount deducted from the advertiser's current selling price of the offered merchandise when sold without a trade-in. A general trade-in offer shall apply to all merchandise, including the article advertised.

(b) Such terms as "no money down" or "no cash down" or any similar term shall not be used unless statement is qualified adjacent to the phrase, that such terms are available only if a trade-in is equal to the amount of down payment.

Los Angeles Cleans Up its TV Advertising

If television should come to your town in 1952 (as the FCC has promised to release some frozen channels to cities or areas not now having TV) many of the headaches and bad practices that have been poisonous toadstools in this mushrooming business can be avoided if met head on before they arrive. Among these is the evil of false and misleading and often downright dishonest advertising. This problem, which has plagued Better Business Bureaus and reputable dealers, is one that only the newspapers are in a position to screen, as they are now doing in Los Angeles.

First step in that direction came from Admanager Drew of the Milwaukee Journal. He gave orders to his advertising department not to accept any more dishonest or even sly advertising on appliances and television sets. If the dealers could not sell their sets on the variety of entertainment they provided, on the beauty of their cabinets or appliances, their mechanical features, their excellence and fair prices, he said, then their business wasn't worth the advertising.

In order to guide his staff on what to watch for he set up ten points by which to judge ad copy. Major items were to see that no broad headlines be used with almost invisible small-type qualifying phrases, illustrations unrelated to the displayed item, promotion of lightly stocked models, failure to identify obsolete models as such, questionable contests.

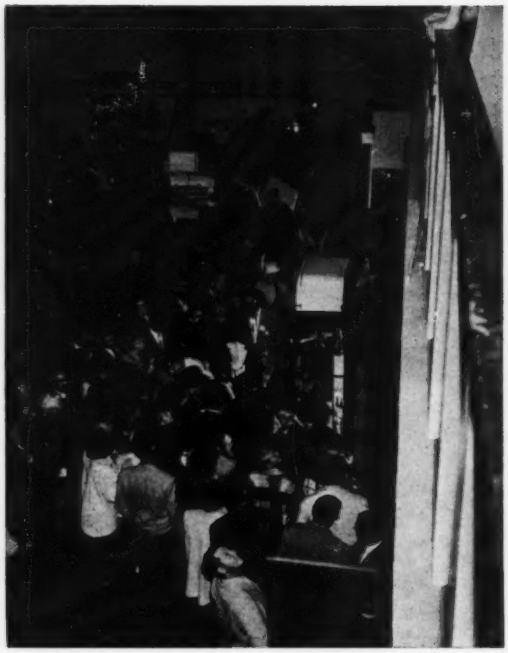
Los Angeles, with its seven TV stations, experienced all the boom and bust ups and downs of TV selling. The ads went wild and wilder until even the newspapers could no longer stomach them. Finally members of the Los Angeles Newspaper Publishers Assn. decided that their own good reputations and that of advertising as a medium to reach the public were at stake. The association asked advice from the Los Angeles Electric League. It held some meetings and analyzed the kind of things that were being done.

Out of it came a set of standards for television advertising by which each newspaper could measure ad copy submitted to the paper for publication before it would be accepted and run. Copies of the standards were given to all advertisers so that they would know in advance what to avoid.

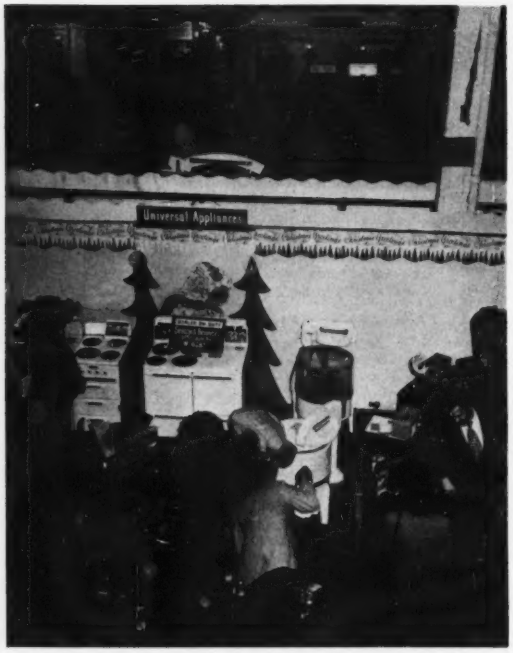
The self-imposed restraints are working. The program has been under way since November. Occasionally some advertiser gets overenthusiastic but, if the copy is run a lot of dealers, who also know what the standards are (thanks to the distribution of copies by the Los Angeles Electric League), let the newspaper hear about it, but quick.

In fact the cleanup of television copy has made dealers and distributors of all appliances desirous that similar standards be set up by the newspapers for all appliance copy. The newspapers seem inclined to agree and similar standards may soon be applied.

The standards set by the Los Angeles Newspaper Publishers Assn. are in the accompanying box at the top of this page.



Ever gracious, hostess Florence Chadwick met the waves of people swarming for her autograph as she had in her channel swim



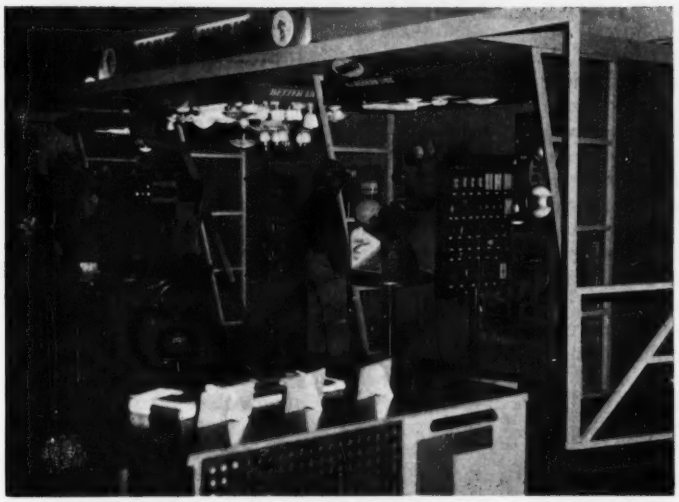
Each space was uniformly decorated, had a product sign above and smaller card telling who the dealer on duty was, and address

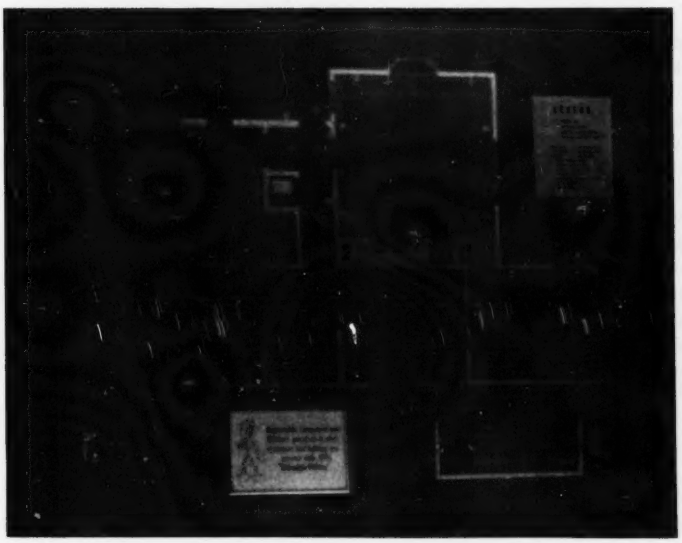
How Does San Diego Do It ?

Its 14th Christmas Exposition tops all previous records of exhibitors, space, attendance and, best of all, sales

Gordon Dawson, bureau president, a dealer, with official show hostess Florence Chadwick, San Diego girl who twice swam the English Channel, and Ed Reed of G-E, show committee chairman

"On the bridge"—the balcony where office of show was maintained is skipper J. Clark Chamberlain, bureau manager, and one of the bureau's wheelhorses, Taylor Brown, Parmelee-Dohrmann





How do they get bigger and better every year? What is the secret? Are the people of San Diego County different from those elsewhere that they respond so to the activities of the Bureau of Home Appliances of San Diego County, particularly the annual electrical and home appliance show?

The 14th such exposition, held in Balboa Park, Nov. 23-28, topped all 13 in number of exhibits, size of exhibition hall space and in attendance. San Diego police declare that the park in all its history never had such traffic and so many visitors. J. Clark Chamberlain, bureau manager, estimates that 185,000 people visited the exposition, and 50,000 jammed the four big exhibit halls on Sunday, Nov. 25. Exhibitors were literally pinned to the walls of their booths by crowds.

Exhibitors were unanimously delighted and declared sales spurted upward beginning with the show and continuing through Christmas.

If there are any "secrets" to the success of these shows since 1933, it can be summed up thus: (1) These shows have been run each year, so that the public has come to expect them. (2) They are free, and whole families flock in. (3) Cost to the exhibitors is low—$100 for a 10-ft booth space to contact 150,000 people. (4) Decoration is provided and it is uniform. Backgrounds, product signs, etc., are uniform. (5) The decoration is modest and strikes a low common denominator, it isn't fancy, moderne, or high falutin'. (6) There is only enough entertainment to make a break in the afternoon and evening. (7) Door prizes are given out after the entertainment afternoon and evening. (8) Popular features, like the big model train display, attract crowds to each of the buildings. (9) It is a selling show; dealers and distributors get results from it. To insure uniformly good TV reception all exhibitors were asked to tune only to the local station KFMB.

Show committee of the bureau was headed by Ed Reed, General Electric Co., and had on it Lee Bornstein, Lee Distributing Co.; Bob Redfield, Graybar; George Porter; Ed Nystrom, Kierulff & Co.; Gene Kramer, Distributors Inc., and Ed Meise, San Diego Gas & Electric Co. J. Clark Chamberlain, bureau manager, had as his assistant show manager Lloyd Boutton.

Wiring and lighting exhibits included fixtures and the adequate wiring section, which displayed fixtures and fittings and, in an inside darkened room, fluorescent drawings of a house floor plan with and without A-W

ELECTRICAL WEST

1952 — Assets and Liabilities

THIS is the time for year-end balance sheets, the weighing of assets and liabilities. As the electrical industry here in the Far West starts bravely and confidently into a new year of responsibilities and opportunities, how does its balance sheet look? Two holiday letters from utility executives sum it up in general terms.

On the liability side one says: "Incredible moral decay is prevalent—most everything carries a price tag and there is a mad chase for the 'fast dollar.' Simple honesty, common decency and high ideals have ceased to be virtues for many. Men's minds have been warped by false doctrines. Ambition is stifled and incentive destroyed by oppressive taxation and other acts of government. In the U. S. the shadow of a police-state lengthens and inflation menaces our way of life. The world is an armed camp. There is no such thing as real security and the future defies forecast."

On the asset side another makes this summation: "It is fortunate that Christmas comes periodically to remind us that the light kindled two thousand years ago still burns brightly for all of us to see if we but look. An answer to the cynical and disheartened is the irrefutable evidence that, despite the vicissitudes of many centuries, man's lot on earth has become better; he has progressed. Thus this properly is a time for rejoicing, a time to remember that life is not just a sequence of daily events, that it has purpose and many satisfying rewards."

In these two appraisals, it might appear that the liabilities overweigh the assets. However, the fact remains that we are continuing to gather strength against the forces of Communism. In the buildup of this strength our industry is playing a great and leading role. Similarly it is fighting valiantly against the internal forces that endanger our freedom and liberties.

So it is that as alarming as the liability side of the ledger may appear as we launch forth into a new year, we do so with more than just hope. We look ahead with the conviction that our industry will continue to contribute to human progress and human liberty.

In Case of Disaster

EVER since World War II, utility crews have been especially trained to act if and when disaster struck any community. With the widespread application of mobile radio to utility vehicles the effectiveness of these crews has been multiplied immeasurably. How well this program works was dramatically demonstrated in Denver last month by crews of the Public Service Co. of Colorado. A B-29 bomber crashed in a Denver residential district spreading death and destruction. Within two minutes after word of the crash was broadcast on police and fire department radio, word had been relayed to Public Service crews and the first group was on the scene. Possible explosions were averted when they shut off all gas in the vicinity of the raging gasoline fire. Another crew arrived with the first firemen and cut off power service. A third crew arrived and all were pressed into service in the rescue work. Heroic efforts such as these seldom make newspaper headlines but they demonstrate the efficiency and devotion to duty of the men who make up the utility crews.

Leadership Regained

FOR a time it appeared that the leadership in high-voltage transmission won by the utilities in the Far West after years of pioneering through research and field application was to be lost to the East and Middle West. Now that leadership may be regained without serious challenge. Three projects figure in the change.

In Canada the British Columbia Electric Railway Co. has completed designs for a 346-kv transmission line, which ultimately will bring power 340 miles from West Kootenai to Vancouver. The initial 90-mile section of the line from Bridge River to the

EDITORIAL VIEWS

Coast will soon be in operation, initially at 220-kv. This line will employ parallel conductors for each circuit.

In California Pacific Gas and Electric Co. is working on designs for a 440-kv line to bring power from the 1,200,000-kw Pittsburg steam plant to a central distribution point closer to the San Francisco metropolitan area. Economics as well as engineering points to the desirability of a transmission voltage higher than any present commercial application.

In the Pacific Northwest Bonneville Power Administration has finished designs for a 300-315-kv backbone transmission system to bring the huge blocks of new federally built power to the load centers. These new lines will be integrated with present transmission network through autotransformers. The new lines will be part of the BPA construction program for the next fiscal year.

These three projects set new commercial standards for this country. They put this region back into a position of leadership in development and pioneering that it enjoyed when 110 kv, 165 kv, 220 kv and 287 kv each had its genesis here.

It's An Ill Wind

WIND machines are blowing up quite a storm in the orange belt this year. Once tried and found not so effective as desired in preventing freezing of the crop, the use of them declined. But lately someone discovered that, with 15 to 18 smudge pots per acre, the wind machine could stir the warmth around enough to save an orchard. Then the flood of demands for power to serve these short-time yet heavy-demand motors returned.

To meet the requests for lines to these 12½- to as high as 250-hp motors was one thing, especially in a tight material and manpower situation. But the real headache came with an outage. With a dozen or more on a distribution circuit, should that circuit be broken by falling tree limbs, or other causes, it leaves the line to go back on with all those motors to be started at once. And each takes from four to seven times as much current to start as to run. Before the line can be sectionalized and restored to service an orchard can freeze. Then everybody is mad at everybody.

But the utility carries on with this undesirable load because it is a public service that is needed. As one commercial manager put it, "We consider it a worse load than electric house heating." Which caused a heating man to retort that house heating seems to have risen in the world. It is not at the bottom of the list any longer.

As with house heating, where the thermostat control helps solve the problem, so with wind machines a time-delay relay on each motor keeps the restarting from all coming on the line at once. In order to make the operation automatic farmers equipped their wind machines with thermostats but cut out the low-voltage release, which must be manually reset. This would necessitate getting up and out in the cold, something no up-to-date electrified farmer likes anymore. But another electrical device saves him.

IN the light of America's accomplishments through the freedom of enterprise, it is almost inconceivable that we should be threatened with socialism —but we are. We are not threatened with socialism by that name of course. If we in America ever get socialism, it will be by default—and under some beguiling trademark like the welfare state —or an even more appealing name such as "insurance state." The minions and missionaries of socialism in America are busy people. They are clever at propaganda. They don't all work for the government. Plenty of them are in private life. But whoever they are — they are working on the rest of us night and day to peddle our system away. — D. A. Hulcy, president, Chamber of Commerce of the United States.

Hicks Sherwin

Lengnick Kiely

Nolan Collins

Selling, Industry Relations Are Main Topics

Measured by attendance and caliber of program at the second annual conference of the Hawaiian Section of the Pacific Coast Electrical Assn., the future success of this newly formed section is assured. Meeting at the Royal Hawaiian Hotel in Honolulu Nov. 29-30, the 350 who attended, including more than 30 mainlanders, profited by a program devoted largely to selling, industry cooperation, dealer relations and engineering. Hawaiian Electric Co., the host utility, under the direction of Leslie A. Hicks, president, and Harry P. Fields, vice-president, who served as general convention chairman, arranged the splendid program and provided most amply for the entertainment of those who attended.

After a warm welcome, Hicks, speaking in the capacity of a vice-president and director of PCEA, said, "In all the various association meetings I have been impressed by the free and generous exchange of information and experiences. It is just as if a great number of people came together and pooled their patents, because the ideas that they contribute are as valuable as patent rights, but rather than keep them to themselves they freely exchange ideas. It is very valuable to the industry and has done much to make the electrical industry what it is in America today.

"The inventive genius of the American people and expenditure of vast sums of money in research have made available an ever-increasing number of mechanical devices to add to the productive capacity of our people and to raise their standard of living. Increased income of the electrical industry has been plowed back to produce the new devices in tremendous quantities. Jobbers, wholesalers and retailers operating freely across the country, with liberal credit terms, have made new appliances and electric power equipment readily available to homes, factories and public utilities. The public utilities of the country have made available an adequate supply of cheap electric power through two world wars and periods of boom and depression. Today, electric power is the life blood of America's industrial might."

In speaking of the contribution to industry of the PCEA as an integrating agency, Emory D. Sherwin, president, San Diego Gas & Electric Co., and president, PCEA, said, "There is no better way to keep pace with progress in the industry than by membership in PCEA. There is no better way of solving your problems than to participate in meetings of this type." He told how the association functions through workshop meetings and of the benefits the younger men derive from letting their hair down in frank discussion of problems. "We are sending more and more of our younger men to PCEA workshop meetings. Eventually they will attend the conference and present their papers. Your energy, if you put it into the PCEA, will insure the growth of our industry and your growth." He enumerated a long list of accomplishments of the association and said, "the association accomplishes those things most people think just happen."

Moderator R. R. Lyons made room on the program for comments by V. W. Hartley, managing director of PCEA. Since affairs of the association had been so ably covered by Sherwin, Hartley took the occasion to decry the attitude of resignation and air of hopelessness that is so prevalent today toward the increasing waste in government expenditures and consequent growth in the tax burden. "That attitude of resignation is perhaps the objective of a lot of the propaganda and publicity material that is being directed toward us today," he said. "It is like an opiate and a thing we must fight against." He urged that we must constantly be alert to counteract this attitude and fight for the things that made America great. "Whenever you hear half-truths, misstatements and implications made publicly by representatives of government, get up and ask for the completion of the statement and prevent the audience from falling under that spell," he admonished.

Selling Needed

"Salesmen build America" was the subject of an inspiring address by Ray W. Turnbull, commercial vice-president of the General Electric Co., San Francisco. "In my book nothing happens in the electrical industry until a salesman gets an order," said Turnbull. "That's the start, not the finish. Without salesmen who are recognized as having that capacity and that ability to build business, we wouldn't have much business. To me a salesman is the greatest exponent of the American free enterprise system that benefits the uncommon man, who shows by his personal efforts that he can rise above the crowd. Picture the large group of people who are called salesmen, but among them

Moncrief Jr. MacKenzie

Geoffroy Hampton

Thorne Pengilly

at the Second Hawaiian PCEA Conference

there are those men who by personal ingenuity, resourcefulness and activities of various kinds, can boost themselves above the common level and stick their heads above the crowd. No other job in industry, in commerce or in any American industrial activity, brings to the individual the recognized credit for personal performance that salesmanship brings," said Turnbull.

"We are entering an era where salesmen are going to be recognized for their true value because the seller's market is over." The speaker described a salesman as a person with a good pair of feet to carry his head around where he can do a lot of good work. He gave as the four qualities of a good salesman: a good memory, ability to concentrate, good judgment and effective speech. A number of examples of proper salesmanship then were cited. Concluding, Turnbull threw a challenge to management, saying, "It is your responsibility to have your young people know what this great American system of ours means to the young men and women coming into it, so that those with ideals and ideas will not feel that they are looked upon without serious interest. Let's interest ourselves in the young people with ideas and ideals and above all let's never let anyone fail to realize that the opportunity system is still the basic system of America—that system where the uncommon man through his own effort can raise his head above the average and get recognition and further opportunity. That's the American opportunity system!"

"The electrical industry must meet the simultaneous demands of a dual economy—demands of both defense and peace—but this can be done only if the industry fights complacency born of past achievements," said James H. Jewell, vice-president of the Westinghouse Electric Corp. "I have full confidence that we can meet the demands of a dual economy as well as the huge future growth forecast for the industry if we avoid complacency and realize that service to the public is the keystone of our industry and its hope for prosperity," he declared.

"Since 1939," he stated, "the industry's share of the gross national product has risen from 2.04 to over 4.05%. In that same period, the manufacturers have produced over $80 billion worth of equipment at manufacturers' prices, more than twice the dollar value of the entire previous output. During this period, the price per kilowatt-hour for electricity decreased 12% despite a rise of 210% in cost of materials, plus 109% jump in wage rates. The over-all cost of living figure rose 71%.

"Despite this past growth, predictions indicate an even greater growth for the industry," Jewell said. "The estimate of a total of 140 million kilowatts in new generating capacity for the United States in the next decade underlines the magnitude of the expansion facing us. Simultaneously, the electrical manufacturer must double his capacity during that same period. To be available in the short-range future is the gas turbine-generator. A number of these in ratings from 5,000 to 15,000 kw have already been installed on the mainland, or are on order. Our industry is working closely with the Atomic Energy Commission to make atomic energy available as a source of heat for generating electric power. Five large utility companies are studying this problem with joint contractors."

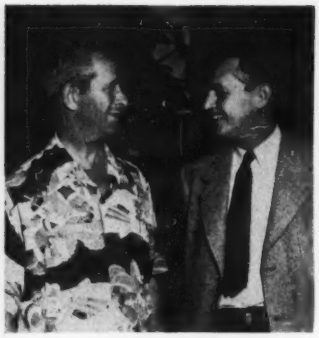
Some suggestions to aid the industry in meeting its future expansion were given by Jewell. "First, we must sell the engineering profession to the youth of America's high schools," he said. "One method might be to set up a graduate student plan, which would enable young men to further their education in exact conformity with their duties in the industry, then follow their development closely in order to determine where each will best fit into the organization later on. We must return to the aggressive type of sales programs so successful in the past. At the same time the dealer who sells our products direct to the public must improve his service to that public. Finally, we must seek public recognition of our services." The speaker strongly urged that an information effort be aimed at government representatives as well as the general public. "How else," he asked, "can they understand our problems? How else can they proceed along a fair path of legislation for all concerned?"

Island Economy

"Wealth can only be created as a result of taking some natural resource and having it converted to something people can use through the means of human resources," said Dr. Leonard D. Baver, director, experiment station, Hawaiian Sugar Planners Assn. He was referring to the economy of the Islands and the significance to the

Field Turnbull

Maytham Lyons



Anderson Jewell

electrical industry if bagasse (sugar cane stalk residue) is used for pulp instead of for fuel. He told of work that has been going on to use this residue for pulp for making paper and predicted that such use of bagasse would be in common practice within a few years. When that time comes it will be a challenge to the electrical industry to supplant the sugar refinery load now supplied from isolated plants burning bagasse as fuel, with central station service.

Dr. W. Harold Loper, superintendent of public institutions, Territory of Hawaii, told of the progress being made in bringing economic education to Hawaii. He said a movement is well under way to establish an economic workshop, inviting in a representative of major industries to serve on an advisory council. The objective is to better the economy of the Islands and to eliminate economic illiteracy.

Tell It In Simple Language

The electrical industry should tell the public how business works in simple language, said Ashton B. Collins, New York, originator of Reddy Kilowatt. Today the American business economy is a crazy quilt of socialistic patchwork. The government tail is wagging the dog with its new deals and its fair deals and its many isms, with a moral letdown that would make our forefathers turn over in their graves. People are beginning to get the story and to know there is danger involved. "I would like to put it this way," he said, "we all know that our government is in a cold war with Russia, but how many of us realize that we as businessmen are in a cold war with Washington. All business men, whether they realize it or not, are being forced into politics. Whether you like it or not you have got to take a hand in politics."

"There is no chance of appeasement in the electrical industry with public power," said Collins. "Public power is a goal of socialists, it is a goal of the present administration in Washington, and there is no chance of appeasement. You have got to come out fighting all the way to protect this industry, and we have got to sign our names to it. We must tell our story as businessmen at the grass roots, and simply. This must be done in your own back yard at the grass roots and with the voters. We have to package these ideas of the industry simply and attractively and we must start with our own employees. Good service and low rates are not enough. The public is not interested in your past achievements." The speaker went on to show how low rates were not a solution to the problems of the railroads — they went bankrupt notwithstanding.

"Power companies have lost that friendly personal contact through bigness and must rely on the written word and the advertising word," he said. "The advertising story is the one that has not been given the place in the picture that it should have. The advertising budget of the public utilities is the lowest of any industry, and I am ashamed of it," said Collins. "We must advertise with color, play to the emotional appeals and dramatize for the new people who are coming along. The role that emotion plays can hardly be overemphasized. We have never properly put emotion into this business of ours," he declared.

Engineering Economics

The second day of the conference was given over to parallel sessions of the engineering economics section and the business development section in the morning and a concluding session in the afternoon devoted to lighting.

Electrical problems in the pineapple canning industry were discussed by John A. Ray, electrical design engineer for Hawaiian Pineapple Co. He stressed particularly the program of preventive maintenance his company follows. Motors are periodically taken out of service on a regular maintenance schedule. They are then cleaned, tested, reinsulated, lubricated and in every respect completely rehabilitated. This program has paid off in eliminating costly shutdowns, said Ray.

J. T. Orrick, McBryde Sugar Co., raised the question of what the problems in a sugar mill will be when bagasse, which now is being burned to make process steam, is diverted to the making of pulp and cattle feed. He said this change would not come about immediately, but eventually would greatly improve the economic position of the sugar industry in Hawaii.

A comprehensive analysis of distribution systems for utilities and industrial plants was presented by J. E. Barkle, Westinghouse Electric Corp., East Pittsburgh. He said that we have learned that we can plan systems to handle the unprecedented loads in the long-term trend toward greater system loadings. Physical apparatus will not answer the problem of load growth. The answer lies in system planning. Barkle showed by slides the evolution of distribution systems for all types of territory and load densities from commercial areas to industrial and residential loads. He showed how the manufacturer has developed the unit substation, a distribution transformer that solves the problem of secondary banking, and various other equipment to meet the needs of any particular distribution problem. This has made the problem of the distribution engineer easier and has improved reliability, at the same time reducing costs. Similar unitized packaged equipment is also available for the industrial

Barkle Williams

Bargion Long

Hawken Churchill

plant, Barkle told the group.

"Twenty years from now systems will be between three and four times as large as they are now," Barkle said, "and most existing equipment will become less and less important and will be substantially replaced." Thus perhaps this is the time to consider one of the eleven planned systems described in the talk, for the utility or the industrial distribution system, suggested the speaker. Experience has proved that large dividends will be the result.

Business Development

Reporting the work of the electrical living committee for the last year, G. G. Geoffroy, sales manager, Easy Applinace Co., said that there had been prepared for the architects and engineers a three-ring binder that includes complete specifications for all home appliance distributors in the Hawaiian Islands. The committee plans in each quarter of 1952 to promote a concentrated advertising and sales drive on some specific home appliance, primarily automatic washers and dryers and ironers. A united front will be presented by wholesalers, distributors and the utilities.

Competitive fuel costs in Hawaii were discussed by David M. Moncreif Jr., Hawaiian Electric Co. He presented a chart showing relative costs of cooking and water heating with liquid petroleum gas and with manufactured gas in Honolulu. Although at the present time better than four out of five homes are going all-electric, dealers were urged to increase their sales even further by informing their customers that electricity is approximately 15% cheaper than manufactured gas and 23% less than LPG. He made a chart presentation that the utility is using in dealer sales meetings, which graphically presents the advantages of electric cooking and water heating.

In discussing FHA financing as it can be used by the appliance dealer, John V. C. Ewing, Bank of Hawaii, said that the banks are most willing to lend under Title 1, so that dealers can finance home modernization. Funds can be used for kitchen equipment, including wiring and plumbing, he said. An interpretation of regulations of what would and would not pass was given and dealers were urged to take advantage of government financing to further sales. Loans are made up to 36 months, he said, at what amounts to 5% block interest.

Dealer relations was the subject chosen by Kenneth Hampton, manager, Valley Electric Supply Co., Fresno, Calif. He discussed the growth of the electrical industry and how it has increased in volume of sales, stressing its contribution to easier and better living. Great possibilities lie ahead, said Hampton, because of the many new and improved products being developed by the manufacturer. In order to meet that new market all branches of the industry will have to cooperate, and the retail dealers especially will have to be alert. "We are employees of one of the greatest businesses ever created," Hampton said, "but every man and every branch of this industry must first carry his own responsibility and do those things that need to be done as a group because they can better be done as a group. Every employee in this industry and every man in it needs to shoulder his responsibility first and then call on the other fellow to help him. Every one in this industry should be willing to put back into it group action and a little bit of ourselves—a little bit more than we do just to be on the job each day. If we do that we leave this industry a far bigger and better industry than we found it, and there is a deep satisfaction in that. All of us in this industry will grow as it grows and the least of us is playing an important part when we back up the whole industry. It is hurting everyone else in the industry when we say a bad word about anyone in it, so let's go down the road together to more prosperous times in future years, because we will never catch up with the tremendous job we have ahead of us," Hampton said.

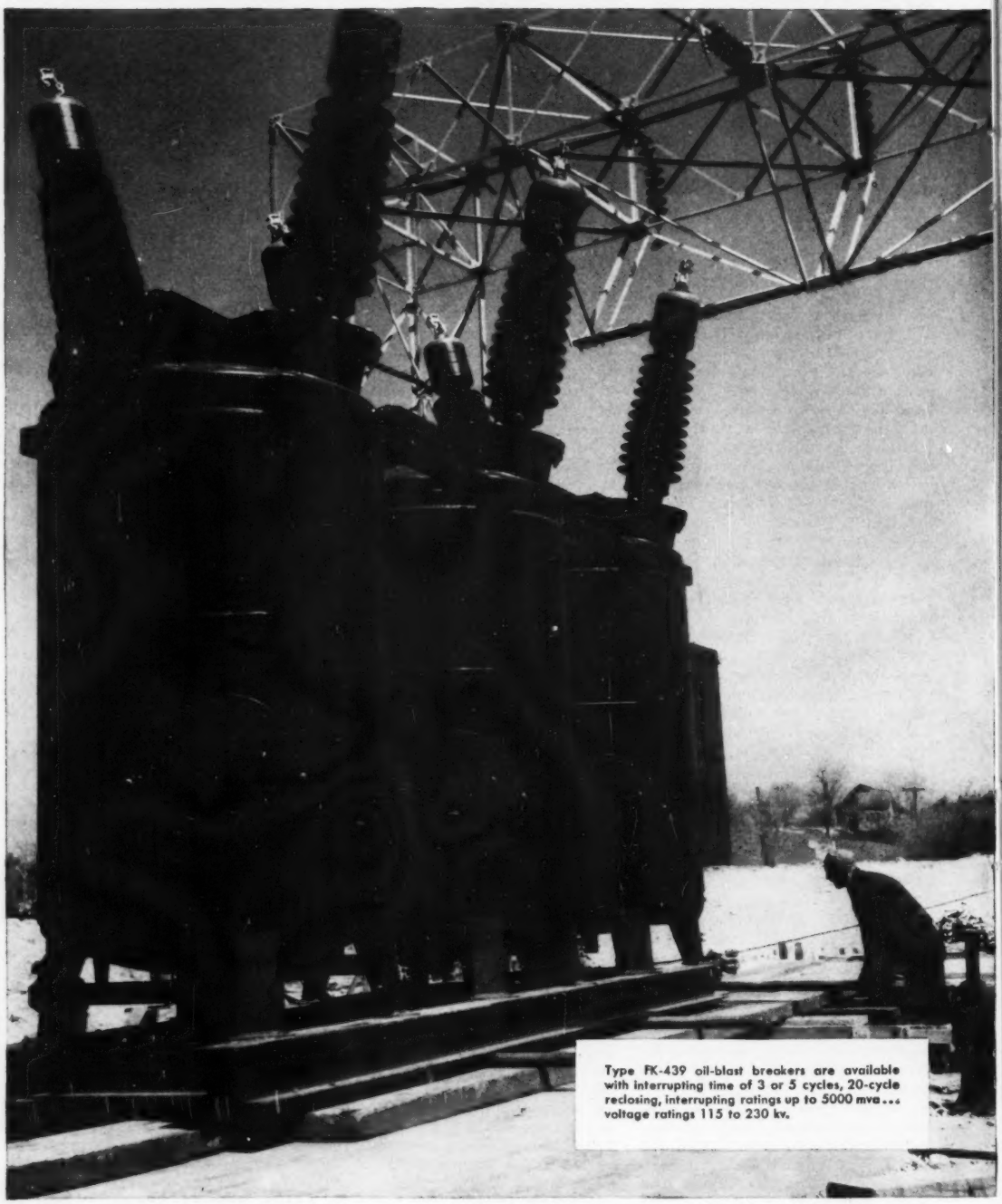
Hawaiian Electric's home service department, under Erma Meeks, presented a well-done and well-received skit showing how easy it is to use modern home laundry equipment and save a lot of work and gain leisure time for the homemaker.

Lighting

In laying a background for his story on commercial and industrial lighting, Charles R. Long, Westinghouse Lamp Division, San Francisco, said that the sense of sight accounts for 87% of all our impressions, and of the five senses the other four account for only 13%. Sixty-two per cent of things seen have a better chance of being retained, he said. One-fourth of the total bodily energy expended is consumed in seeing under normal light. That is why lighting is so important, Long declared. It is a production tool instead of an overhead, and should be looked upon as such. It is a means by which greater production may be had from workers. We would not consider a dull file or a poor saw, he said, yet we tolerate poor lighting.

Long demonstrated a number of new lamps now available and described their application. He said we have four wave lengths that can be sold over the counter. These are, black light for revealing flaws and

Central Hudson Gas and Electric



Type FK-439 oil-blast breakers are available with interrupting time of 3 or 5 cycles, 20-cycle reclosing, interrupting ratings up to 5000 mva... voltage ratings 115 to 230 kv.

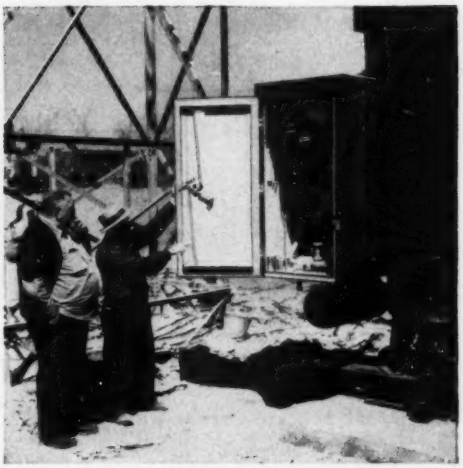
adds 33,000 kva of capacity

Type FK-439 oil-blast breakers protect new 110-kv system

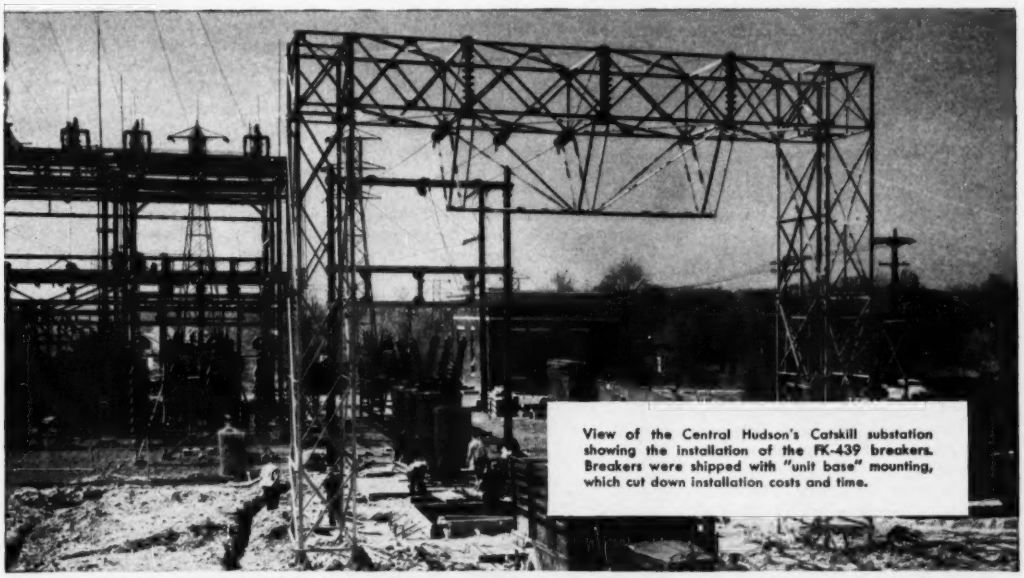
Recently Central Hudson Gas and Electric Corporation embarked on an expansion program to add 33,000 kva of capacity to its Catskill substation. Since plans called for changing high-line voltage from 66-kv to 110-kv, new circuit breaker equipment was necessary.

Company officials chose G-E Type FK-439 oil-blast breakers to protect the new installation. Multi-break interrupters and a dependable pneumatic operating mechanism provide high-speed performance and operating economy. Completely sealed bushings and accessibility of all internal parts simplify inspection and maintenance. Breakers were shipped with "unit base" mounting, which cut down installation time and expense.

Investigate these and the many other economic advantages to be realized when you use G-E switchgear on your system. Ask your G-E sales representative for further information on the FK-439 breaker, or write for Bulletin GEA-4407B, General Electric Company, Schenectady 5, N. Y.



Pneumatic operating mechanism is easily accessible. All working parts have an adequate margin of strength for safety and durability. Thoroughly tested and proved, built for dependable performance and operating economy.



View of the Central Hudson's Catskill substation showing the installation of the FK-439 breakers. Breakers were shipped with "unit base" mounting, which cut down installation costs and time.

GENERAL ELECTRIC

819-13

With factories in Anaheim, Los Angeles, Oakland, Ontario, San Francisco, San Jose, Seattle, and Richland, and Sales Offices in twenty Western cities.

fractures, the sun-tanning band, the germicidal-killing band, and the ozone or odor-control band. In the latter there is a new ozone or odor-control lamp that is taking on rapidly, and he predicted great progress in this field.

Street Lighting

Street, highway and airport lighting were discussed by Warren Edman, Line Material Co., Milwaukee. Within the next 30 days we will pass the one millionth traffic death, he said, and the chances are three to two that the fatality will occur at night. We are in the model T days so far as traffic lighting is concerned and, while we have made great strides, we still have a long way to go. We are dealing with very low levels of illumination to see large objects—hence the difficulty of the problem, said Edman. He decried the fact that we spend more for candy bars and more for cigarettes in one week than we spend for lighting in a whole year. This is the more deplorable, he said, when it is a provable fact that the savings in accident insurance premium rates alone will pay for good street lighting. According to Edman, $2 per capita can be justified for good street lighting, whereas many cities spend as little as 30c per capita. Street lighting has not gotten a fair share of the dollar and we have a mission to fulfill, he said.

In discussing airport lighting, Edman said airport lighting with presently developed equipment can do a job below 100 ft in runway lighting, but approach lighting is all in a state of confusion. CAA, the Army, the Navy, Air Force and other official bodies, after numerous experiments and tests, cannot agree on the proper approach to the problem.

NISA

Los Angeles Chapter of NISA elected W. M. Hogue, Larsen-Hogue Electric Co., for its president for another year and William Pompey, Pompey Electric Co., Pasadena, vice-president. E. F. Sweinhart was re-elected secretary-treasurer. The chapter noted a membership increase of 20% for the past year.

March 15, 1952, has been set as a closing date for entries to the national award contest of NISA. There will be 14 prizes amounting to $350 for the best suggestions for gadgets, tools, improvements to the motor shop business. Entries may be made by employees of any of the member shops.

New officers of the Idaho State Electrical Contractors Assn.: seated—Lysle Keith, Boise, treasurer; Russ Morton, Idaho Falls, president; Merritt Shotwell, Twin Falls, vice-president; J. Carl Baldridge, Boise, secretary. Standing—Floyd Pollard, Kimberly; Fred Day, Mountain Home; John Baldridge, Payette; H. L. Babitt, Idaho Falls; and Gene Jensen, Twin Falls, all directors. Many have served during the previous year

Concentrated Convention in Idaho

Without an immediate program for changes in the Idaho state electrical law to bring before its members, the Idaho State Electrical Contractors Assn. annual meeting at Boise, Dec. 3, was concentrated to a packed one-day session, presided over by Joe Gilgan of Caldwell, its president.

Instead the group, representing all parts of the scattered state, heard Lt. Gov. Edson Deal, Labor Commissioner W. L. Robinson, Frank C. Church of OPS, Britt Nedry of the Bureau of Occupational License, Orland C. Mayer of Idaho Power and Matt Sherwood of NECA. And Earl Haroldsen gave them a very practical and useful explanation of how they could wire a house on 35 lb of copper. The four local distributors each had a ring in the "circus," and the "live wires," or women's auxiliary, staged a banquet to conclude the successful affair.

Joe Gilgan turns over his president's gavel to Russ Morton who succeeds him

With 95% of Idaho's farms electrified, said Lt. Governor Deal, the state's 350 electrical contractors have a professional responsibility to safeguard the safety of all who use electricity so lavishly in that state. Since electrical installation requires adequate professional knowledge, he said, electrical contractors should strive to maintain a professional viewpoint and status.

Responding to the Lieutenant Governor, A. R. Woolley, Pocatello, past president, defined the meaning of sincerity and showed its application to a contractor's dealings with his customers. Only sincerity in all dealings will earn public respect and advance a contractor into a professional status.

A panorama of the opportunities that are ahead for electrical contractors in Idaho was given by Orland C. Mayer, industrial development manager, Idaho Power Co. By showing what has happened and what is in prospect in development in the state, and the power supply being built to take care of it, Mayer raised the hori-

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Cross Section Showing Indentations.

Easier to use and neater in appearance, Briegel All-Steel Indenter Fittings not only make stronger connections but also make each job more profitable. Contractors the world over recognize their cost cutting qualities and the fact that they make each wiring job a better job. It is only natural that Briegel Fittings are the most widely used E.M.T. connectors and couplings.

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The M. B. Austin Co., Northbrook, Ill.; Clayton Mark & Co., Evanston, Ill.; Clifton Conduit Co., Jersey City, N. J.; General Electric Co., Bridgeport, Conn.; The Steelduct Co., Youngstown, Ohio; Enameled Metals, Pittsburgh, Penn.; Wagner Malleable Products Co., Decatur, Ill.; Kondu Mfg. Co., Ltd., Preston, Ont.

zon of those in the meeting from an immediate competitive job to broad-scale opportunities for many and bigger jobs. In nine years since 1940 business firms have increased 40%, manufacturing 60%. In that time construction by contract has increased 471%. Then he visualized the business increase to come from Idaho Power's program to develop 957,000 kw in the next 10 years, to double present energy sales. To use that energy would mean a tremendous market both for electric equipment and wiring to connect it.

Controls then came in for explanation and discussion. Frank Church of Office of Price Stabilization discussed and explained CPR-93, the new order to cover the construction industry. Britt Nedry listed the 13 occupations in Idaho now under license and control and administered by his department. W. L. Robinson, commissioner of labor, summarized Idaho's labor laws and told of the department's facilities for mediating labor disputes. Homer Budge, representative in Congress from Idaho, expressed alarm at the increasing invasion of constitutional rights by the federal government and deplored waste of tax money in government operations.

Matt Sherwood, director of the Western regional office of National Electrical Contractors Assn., spoke of the special services for contractors that members in NECA have available and described its educational program and activities. He stressed the electrical contractor's opportunity to improve his position in the electrical industry.

Conserving Copper

The practical feature of the entire convention was Earl Haroldsen's talk, illustrated with diagrams and charts, on "How to wire a house on 35 pounds of copper." By careful layout, such as placing of the panel in a direct line with the service to the electric range, and by using low-voltage relays for switching, and multiple-outlet assemblies such as Plug-mold or Plug-in-strip, he totaled up the copper wire to 34.7 lb. This was for a house with a dryer, range, water heater, 26 lights, 12 convenience outlets, 12 3-way switches, 7 single-pole switches and 2 door switches. The house had about 1,500 sq ft of floor space.

Final afternoon feature was a "Distributors Circus." Each of the local supply distributors was given a 20-minute opportunity to present either a product or an idea.

Henry Faulkner, manager of Westinghouse Electric Supply Co., demonstrated Safety Seal. Joe Wright, Rod Fletcher and Gus Davies of Afton Lamp Co., presented a clever skit in which Fletcher acted the customer wanting to build a house. Joe Wright was the price-cutting type of contractor who tried to eliminate all the service and convenience features in order to sell a low price. Gus Davies represented an up-and-coming contractor who really sold a good job for about four times the other's price. Les Johnson, General Electric Co., was G-E Supply's speaker. He told of several new devices and ideas to be used in wiring. Martin Talbot of Graybar did the same with several lines carried by that distributor.

Russ Morton of Idaho Falls was elected president for the coming year to succeed Joe Gilgan of Caldwell. Merritt Shotwell of Twin Falls was named vice-president; J. Carl Baldridge was re-elected secretary, Lysle Keith of Boise, treasurer, and Spencer Lewis and John Naning were added as directors.

A strong resolution was presented opposing the government's proposed high dam at Hells Canyon.

"The Live Wires," formed last year by the wives of the members, was given a vote of thanks and confidence by the association. The women handled the social features of the convention, particularly the banquet. The convention committee was headed by Past-president William Hopper as president, with Carl Young in charge of registration, Lysle Keith of publicity, Joe Gilgan, banquet; Martin Talbot and Bill Shelly, distributor participation; and Ferd Koch, program. Despite a big storm that day the attendance was good, some 30 contractors attending. There was also a good attendance of allied trade representatives.

"The Live Wires," they are called; wives of members, who handle the social end of the meetings. Seated—Mrs. W. A. Hopper, treasurer; Mrs. R. C. Young, vice-president; Mrs. Joe Gilgan, president; Mrs. Lysle Keith, secretary. Standing—Mrs. J. I. Wright, Mrs. Dea Board, Mrs. H. H. Falkner, Mrs. Vern J. Smith, Mrs. H. M. Shelley, Mrs. J. C. Baldridge and Mrs. Kenneth R. Jones. The women's group organized last year

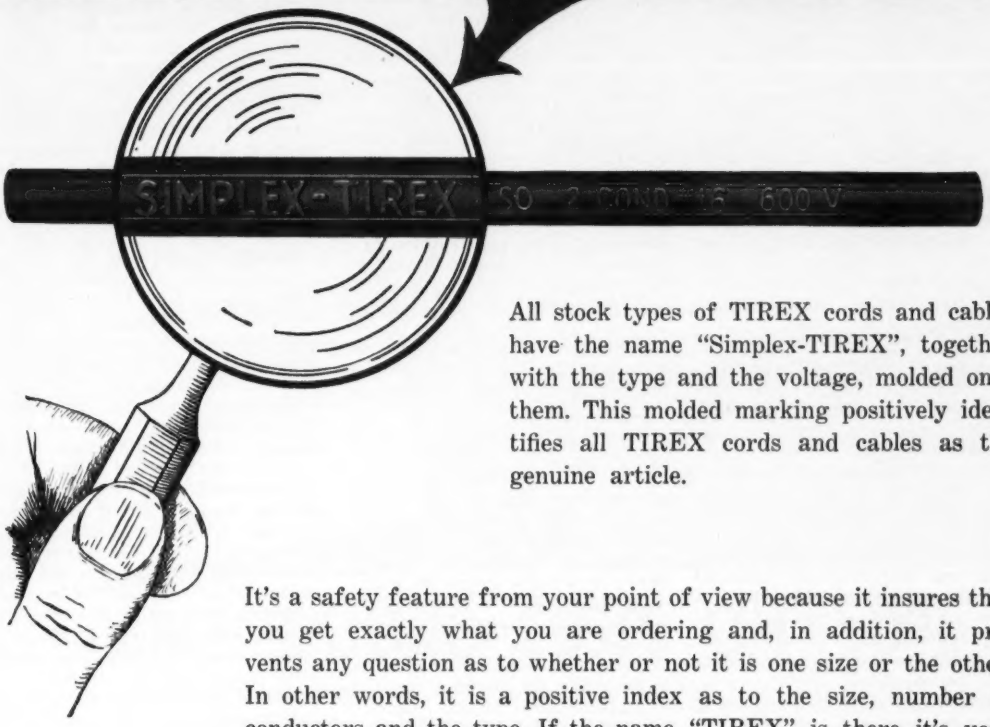
Idaho Chapter?

Whether to form an Idaho Chapter of NECA was discussed by a number of the contractors who had attended the Idaho State Electrical Contractors Assn. convention, on Dec. 4, in Boise the following day. Matt Sherwood, director of the Western regional office, explained the requirements to form a chapter and answered questions about NECA and chapter operation. He left it up to the Idaho contractors to determine whether their own conditions were such, in a widely scattered territory, and with travel expenses high, that a chapter was feasible economically.

Another who spoke was William Blackmar, Montana Chapter manager and now part time field representative for NECA in Division 8. Blackmar's own chapter in Montana faces similar distance difficulties. It was estimated that approximately 3% of labor pay roll would be needed to operate a chapter in Idaho.

At present several Idaho contractors belong to the Utah-Idaho Chapter, with headquarters in Salt Lake City. These are the Pocatello and Idaho Falls contractors. However several felt a chapter was possible and pledged financial support to start it. Blackmar was to work in the territory to follow up but bad weather caused postponement until after the first of the year.

THIS IS THE MARK OF Quality



All stock types of TIREX cords and cables have the name "Simplex-TIREX", together with the type and the voltage, molded onto them. This molded marking positively identifies all TIREX cords and cables as the genuine article.

It's a safety feature from your point of view because it insures that you get exactly what you are ordering and, in addition, it prevents any question as to whether or not it is one size or the other. In other words, it is a positive index as to the size, number of conductors and the type. If the name "TIREX" is there it's your assurance that you are getting genuine Selenium Neoprene Armored TIREX.

The next time you need portable cords or cables be sure you specify TIREX and then be sure you get it by insisting that the cord or cable you get is marked "Simplex-TIREX".

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All-Industry Meeting Proposed

Washington Contractors' Society and Inspectors would organize in March for state law changes

A plan for a convention of all segments of the electrical industry, principally to discuss legislation, was proposed to those attending the convention and exposition of the Electrical Contractors Society of Washington, in Seattle Dec. 8, Arthur Siegal, its president, in the chair. The plan was unfolded by T. Ralph Neilsen, executive secretary, who had made the original proposal to the Puget Sound Chapter, International Association of Electrical Contractors, at its Everett meeting, and received the endorsement of that group.

In a brief but pointed speech on "Legislation," Secretary Neilsen said: "It is not important at the moment what kind of legislation is written—the important thing is how to get the legislation through after it is written. Therefore, I propose that the electrical industry in the State of Washington hold a convention in a centrally located city—I have in mind Yakima—not later than March of 1952, and that everyone connected with the industry directly become a party to this convention by invitation, and that all organized groups put machinery in operation to accomplish this objective."

Neilsen told them the president of the Northwestern Section, IAEI, had empowered him to appoint a committee to start the project. He had selected J. Don Gawne, Seattle City Light; Chester Kirsop, chief electrical inspector, Olympia; John Hewitt, state chief electrical inspector; Ray Larrabee, Underwriters' Laboratories, and Tom S. Widrig, Trumbull Electric Mfg. Co. He explained he intended to expand the committee to take in representatives of the industry in areas outside the big cities.

On the subject of the men in the industry in the "sticks," Neilsen said "we must organize our forces on the basis of winning over the independent thinker. We cannot ride herd on one side of the fence with all the Mister Bigs and leave the Mister Littles on the other side. We must remove the barriers and get them together into the same camp and then convince them that the legislation that they so much desire can be theirs if they lay aside petty professional jealousies and animosities.

"I know I am taking a chance when I refer to jealousy and animosity, but let's not kid ourselves—that is keeping us apart. The jobbers, the manufacturers, the agency representatives know that the little fellow that few of us ever have the opportunity of meeting is just as essential to the industry and the community in which he lives as are we who reside in the larger communities. As a matter of fact, a small town contractor is often much closer to his legislator than we of the cities and, if we acquaint him with what is needed, you will have representation on the home ground that is worth more than the time that you spend with him in the lobby of the State Capitol."

At the afternoon session of the convention, which drew approximately 100 delegates representing various phases of the electrical industry, John Nelson, assistant superintendent of Seattle City Light, told his listeners that "the electrical industry is a team comprised principally of the electrical manufacturer, distributor, dealer and electrical contractor" and "that each member of the team has definite responsibilities to the public, the consumer.

"In this regard," he said, "the electrical contractor is the key segment of the electrical industry. Products produced by the manufacturer and distributed through the jobber and electrical dealer are of little value without the necessary wiring provided by the electrical contractor.

"To a large degree," he continued, "the efficient operation of electric equipment is dependent upon proper adequate wiring and installation of the equipment. Here the electrical contractor has a responsibility to the industry as well as to the public. It is necessary that the electrical contractor be constantly alert so that the wiring can keep pace with electrical progress; that the performance of electrical equipment, so far as wiring is concerned, is a credit to the electrical industry."

Quoting a recent survey made by the General Electric Co., Nelson stated that in a midwest area certain electrical contractors "missed the boat" to the tune of 1,600,000 outlets and 387,000 circuits during the first half of 1949. These figures, he pointed out, indicate the additional business that would have been obtained had the 58,000 homes and 13,000 apartment units built during the six months' period been wired to the standard of the certified wiring program. He said, "it would be extremely difficult to figure what the entire electrical industry lost."

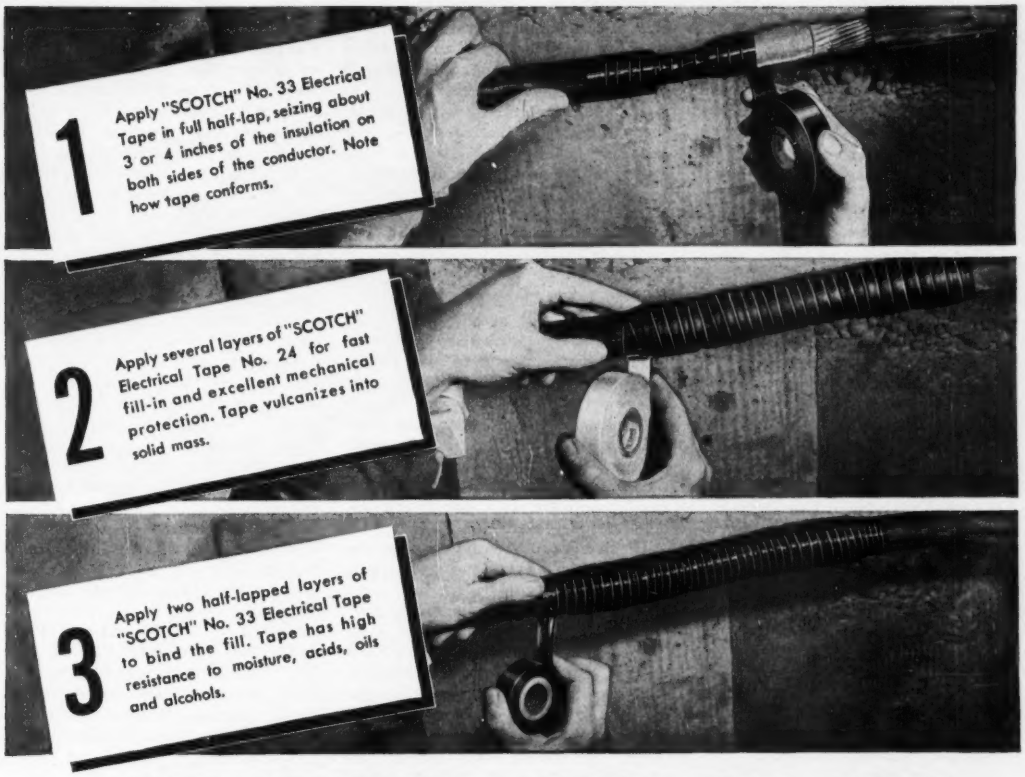
The speaker also called attention to the fact that nearly 100 per cent of all new residence construction in Seattle is wired for use of an electric range and automatic water heater, pointing out that the manufacturers of electric ranges, water heaters, wiring material, etc. have derived vast benefits through this low all-electric residence rate.

He said: "Today with our present economy, under rising costs, the electrical industry must be alert to the reaction of the consumer. We must guard against any feeling that electrical equipment or installations are premium merchandise."

Further he noted that "the electrical contractor can best do his part through more careful planning of each job." He suggested that the contractor should "always encourage and attempt to sell a better and more adequate wiring job," adding that "more care should be exercised in planning the wiring so that not only the immediate needs are met but that such trends as can be foreseen are injected into the planning." He said, "your customer will appreciate these extra values and you will have the satisfaction of providing a better job."

A representative of the Biddle Trade Bureau, A. T. Hutchinson, spoke, saying, "Several points that I want to bring out are old but will bear repeating again and again if your efforts are to produce maximum results. First, let us accept the fact that your competitor is basically a pretty good 'Joe.' He is in the electrical business for the same reason you are—to make a living. His hopes and ambitions are the same as yours. If you will recognize this and through your group activity get him to see the same things, you have accomplished something. You will get out of your association only in proportion to what you have put in. So put in enough to make the other fellow want to come in too."

Explaining the function of the electrical distributor to the delegates, Bill Call, Graybar Electric Co., among the several speakers introduced by Arthur Siegal, president of the society, said that "the electrical distributor is not in business just to


1
Apply "SCOTCH" No. 33 Electrical Tape in full half-lap, seizing about 3 or 4 inches of the insulation on both sides of the conductor. Note how tape conforms.
2
Apply several layers of "SCOTCH" Electrical Tape No. 24 for fast fill-in and excellent mechanical protection. Tape vulcanizes into solid mass.
3
Apply two half-lapped layers of "SCOTCH" No. 33 Electrical Tape to bind the fill. Tape has high resistance to moisture, acids, oils and alcohols.

CABLE SPLICING COSTS CUT 50%

New, easy method employed with "SCOTCH" Electrical Tapes at world's largest soy bean plant in Illinois

No more need for clumsy coating materials on this kind of splicing job! Neoprene-jacketed 500 MCM Anhydrex cables are butted together in a copper sleeve, soldered, and wrapped with two "SCOTCH" Electrical Tapes as shown above. McCarthy Bros. & Ford, contractors on the job, estimate a saving of 50% in time and material at Spencer Kellogg & Sons—soy bean processors in Decatur, Illinois.

"Just any" tape wouldn't work. Chemicals in the air (such as hexone and industrial oils) caused insulation failure in a very short time. That's why this experienced contractor *specified* "SCOTCH" No. 33 Plastic Electrical Tapes.

There are dozens of these stick-at-a-touch "SCOTCH" Electrical Tapes—each designed to do a specific job *right*—Plastic tapes, glass cloth tapes, Acetate tape, treated paper tapes. Many of these tapes are available with thermosetting adhesives.

Why not take the free help of tape experts? Show us your problem, and we'll show *you* how "SCOTCH" Electrical Tapes can save! Write Dept. EP12 today.

"JOB SIZE" ROLLS of "SCOTCH" No. 33 Electrical Tape are also available. Packed 12 in a screw-top container to keep out dust and dirt, prevent bruising of tape in tool drawers. Rolls are ¾ in. x 20 ft.

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- TOUGH—plastic backing resists abrasion, water, oil, alkalies, alcohols.
- STRETCHY—conforms to any surface.
- HIGH DIELECTRIC—10,000 volts.
- THIN CALIPER—only .007 inch thick.
- WON'T DRY OUT.

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General Export: Minnesota Mining & Mfg. Co., International Division, 270 Park Avenue, New York 17, N. Y.
In Canada: Minnesota Mining & Mfg. of Canada, Ltd., London, Canada.

form a step in the distribution system. The manufacturer does not sell through him because he is a big-hearted Joe who wants to keep a lot of nice fellows in business or because he is too lazy to sell his supplies himself. He sells through the wholesaler," Call explained, "because it offers him the most economical method of selling his product. He is in business to make money and he knows that his cost of performing the three main functions of distribution would be higher if he attempted to sell direct."

Outlining these functions, Call said that first a buyer has to be found; second, the product must be made available to the users—it must be carried in stock—and third, credit must be extended and payment collected.

Call said that by distributing the products of many manufacturers, the average distributor represents some 200 manufacturers. "The wholesaler," he said, "splits the costs of performing these functions over all these lines and thereby sells each line at far less cost than could the individual manufacturer.

"You as electrical contractors," he pointed out, "are of course much more interested in what benefit the wholesaler offers you. Well, the same three functions that I mentioned still apply: that is sales, service, local stocks and extension of credit."

Discussing the Electric Club of Washington, to which many members of the Electrical Contractors Society belong, H. R. Loew, Electric Club president, reviewed the history of the organization.

Currently the Electric Club is sponsoring an Adequate Wiring program in Seattle and King County, and is also sponsoring an Electrical Code for the City of Seattle. Working under the direction of John B. Majerus, manager of the Puget Sound Chapter of the National Electrical Contractors Assn., club members with experts from many electrical concerns and the City Building Department, have prepared a code which is about ready for submission to the Seattle city council.

Warning of the many pitfalls made, "it seems, specifically for the electrical contractor," John Harlow, attorney for the Electrical Contractors Society of Washington, urged that "all contractors beware of 'infant contracts' and 'contracts made with housewives.'" He said "those contracts made with parties under 21 years of age, regardless of whether they are married or not, and those made with housewives, without the consent of the 'man of the family' are trouble makers and are well nigh if not impossible to enforce."

He strongly urged that contractors "watch your bids." Read your specifications! Don't underprice your jobs! And insert protective clauses in your contracts. "Those clauses," he said, "will keep you out of court and will protect you against price increases, delays in shipments, damages in shipments, and in numerous other ways."

Harlow also urged the contractors to get "a written acceptance of all contracts saying that proofs of verbal contracts were hard to obtain and equally hard to establish."

John Hewitt, chief electrical inspector for the state of Washington, spoke on code matters saying that "we need additional legislation and the various segments of the electrical industry will have to cooperate with us in obtaining it." The Washington State Inspection Department, he said, was operated with 11 men. "We could use twice that number." Not more than 17% of rural electrical installations in Washington, usually made by the owner, are inspected, Hewitt informed the delegates.

Winding up the interesting and instructive one-day session, the society hosted a cocktail party and a banquet in the evening followed by the showing of the film, *In Our Hands,* and five high-class vaudeville acts. Attendance at the banquet and show numbered in excess of 200 men of the industry and their ladies.

Well-selected exhibits displayed in the meeting hall, all of which attracted much attention, were sponsored by the following concerns: Rockbestos Products Corp.; L. N. Roberson Co.; Killark Electric Mfg. Co., represented by Northwest Agencies; Jefferson Electric Co.; Allen-Bradley Co., represented by Muth Richards; General Switch Corp.; International Register Co.; William J. Murdock Co.; Crouse-Hinds; Silvray Lighting Inc.; Steber Mfg. Co.; Cavalier Corp.; Ramset Fastening System Inc.; Pryne & Co. Inc.; Trumbull Electric Mfg. Co.; Seattle Lighting Fixture Co.; Westinghouse Electric Supply; Biddle Trade Bureau; Bruce-Emmett Co.; Keeler-White; Cascade Distributors; R. C. Brinkley.

● **The American Power Dispatchers Assn.** for the Southwest area elected B. P. Bengtsson, Los Angeles Department of Water & Power, as president; Cecil Frye, system dispatcher for the Southern California Edison Co., secretary-treasurer; and E. V. Giddings, Burbank Public Service Department, publicity director.

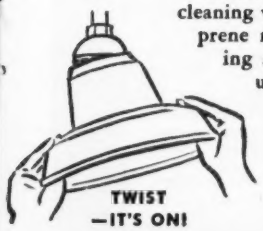
When the Cascade Electrical Contractors Assn. decided to join National Electrical Contractors Assn., it became the Cascade Division of the Oregon-Columbia Chapter. At that meeting in Salem, Ore., were: (seated) C. A. Vibbert, Larry Rodgers, chapter manager; James Walton, chairman of the Cascade Division; W. D. Coburn; W. R. Grasle of Portland, chapter president; Phil Brownell; (standing) Bob Brownell, Chan Brown, Byron Simonson, Clarence Bishop, W. A. Sisson, Lee Andrews, Matt Sherwood of NECA, San Francisco; Paul Silhe, W. D. Coburn Jr., Ralph Farnham, John Riche. Some 15 signed up for the NECA accounting course to begin Jan. 15 Tuesday and Thursday nights for an eight-week course. It will be held in Salem

NEW APPLETON V-51 SERIES

CONVERTIBLE VAPORTIGHT LIGHTING FIXTURES

WITH MALLEABLE IRON BODIES
100 WATT OR 150-200 WATT UNITS

EXCLUSIVE UNIT ASSEMBLY!



Never before a vaportight lighting fixture so safe, so efficient, so easy to install . . . so economically serviced and maintained!

Combined in an exclusive "Unit Assembly," receptacle, globe and guard are detachable as a *single unit* instantly, without tools! Re-lamping or cleaning becomes safe, swift and simple. One trip up the ladder to exchange assemblies, and the job's done!

This outstanding new V-51 line includes 18 different types of rugged malleable iron bodies for pendant, ceiling or bracket mounting. Each body takes both 100 Watt or 150-200 Watt "Unit Assemblies." Each body, except bracket types, is grooved to mount four reflector styles in three different sizes. This *complete interchangeability of parts* permits the assembling of 256 complete fixtures, using only 32 basic components.

Reflector is quickly attached or removed for cleaning without tools—thanks to exclusive neoprene rubber ring attachment. Shock-absorbing socket in "Unit Assembly" permits the use of standard lamps where costlier mill-type lamps were formerly used.

For full details on this great new fixture, write for Bulletin 5-A.

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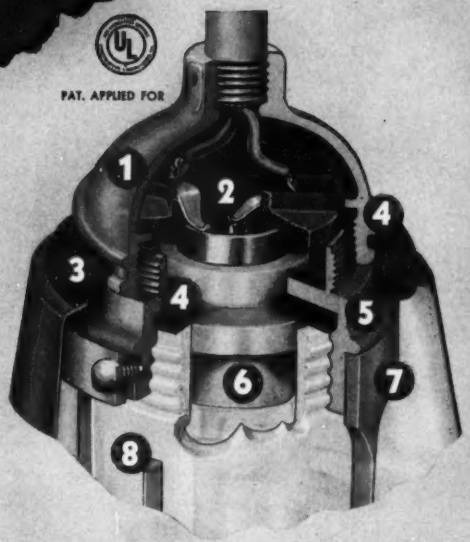

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Sectional View Shows Outstanding New Design and Operating Principles.

1. Malleable iron fixture body.
2. Connecting block with spring leaf contacts.
3. Neoprene rubber ring holds reflector.
4. Vaportight gaskets.
5. Globe and guard adapter body.
6. Shock-absorbing socket.
7. Snap-on type guard.
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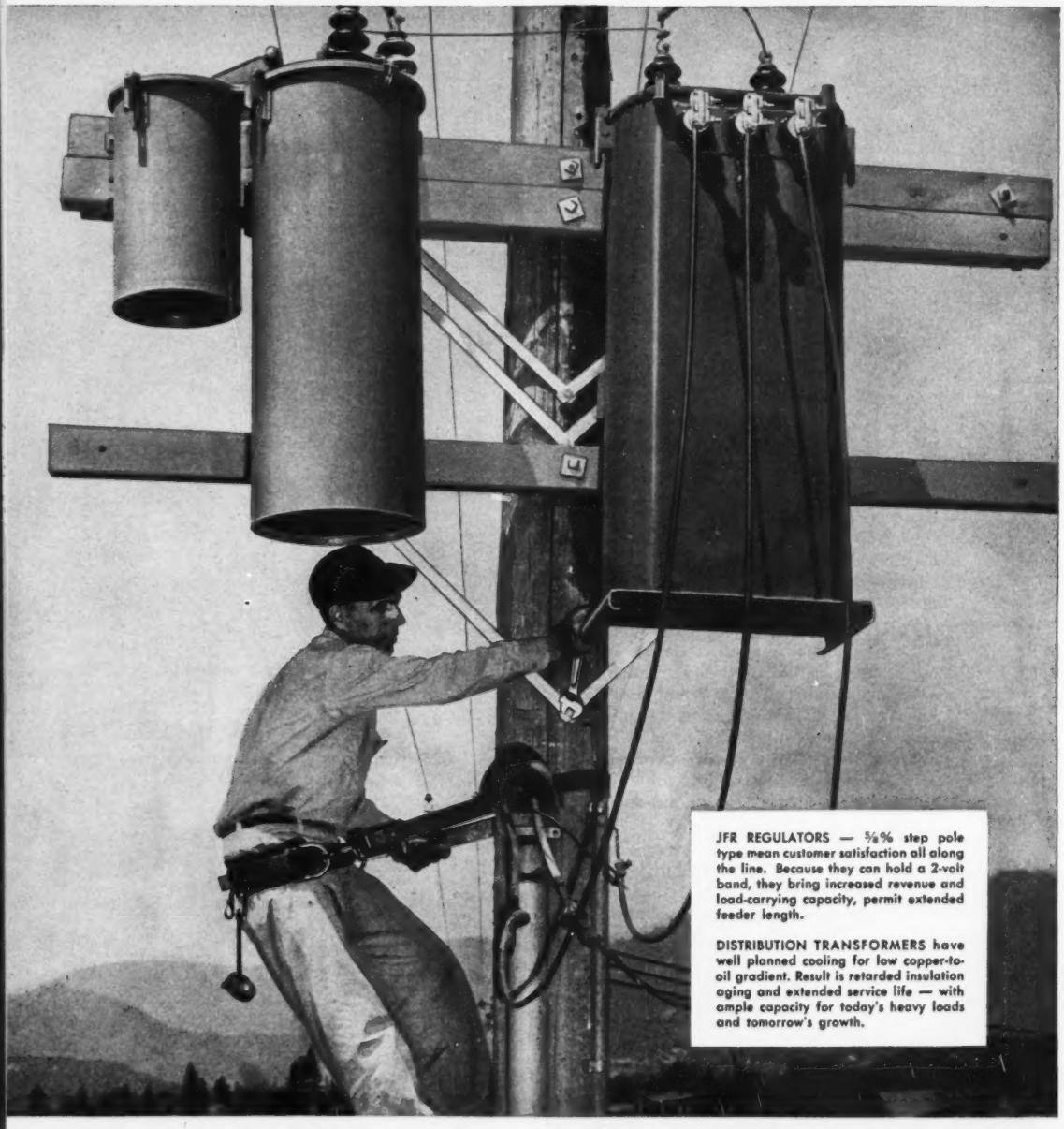
APPLETON ELECTRIC PRODUCTS

Here's Regulation



JFR REGULATORS — 5/8% step pole type mean customer satisfaction all along the line. Because they can hold a 2-volt band, they bring increased revenue and load-carrying capacity, permit extended feeder length.

DISTRIBUTION TRANSFORMERS have well planned cooling for low copper-to-oil gradient. Result is retarded insulation aging and extended service life — with ample capacity for today's heavy loads and tomorrow's growth.

Equipment for Power: Water Conditioning equipment, chemicals and service... Steam and Hydraulic Turbines... Generators... Condensers . . . Steam Jet Air Ejectors . . . Power Plant Pumps and Motors . . . Transformers... Circuit Breakers... Switchboards and Control . . . Switchgear . . . Unit Substations . . . Utilization equipment.

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—BECAUSE EVERYBODY PROFITS!

GOOD VOLTAGE REGULATION pays dividends all around. Customers get all the electricity they need. And they get full value from the power they pay for because their equipment performs better and lasts longer.

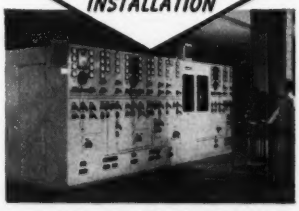
But accelerated growth is pushing peak loads near estimates made a few years ago for 1953, and regulation must be achieved in the face of expanding loads and material shortages.

Now more than ever, your experienced Allis-Chalmers representative can help you utilize the wide line of A-C equipment to solve your power distribution — and production — problems. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3488

Ruptor and *Regulex* are Allis-Chalmers trademarks.

It Pays to Keep Pace with Machinery Progress

EASY INSTALLATION



DUPLEX SWITCHBOARDS are factory assembled for economical installation. Convenient centralized secondary control for primary circuits assures good voltage regulation at the beginning of the line.

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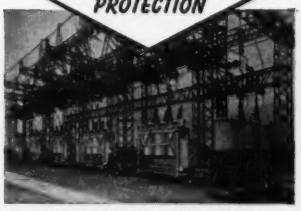

OIL CIRCUIT BREAKERS team up *Ruptor* quick-quench interruptors with mechanically trip-free pneumatic or solenoid operators to minimize system voltage variation by prompt isolation of system faults.

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SYNCHRONOUS CONDENSERS — used indoors or out — supply reactive kva to regulate voltage and stabilize large transmission systems. Air or hydrogen cooled. *Regulex* control adds fast response to changes.

CHALMERS

A-C ALLIS-CHALMERS

PANORAMA OF THE PCEA

Edited by A. X. Schilling

Section Meetings

On March 20 and 21, the Operating Economics Section will gather at the Hotel Californian, Fresno, for sessions of the following discussion groups: communications, G. E. Bishop, Coast Counties Gas & Electric Co., Santa Cruz, sponsor; engineering design, F. S. Benson, PG and E, San Francisco, sponsor; hydrogeneration, F. I. Lawson, PG and E, sponsor; meter, M. A. Fredrickson, Southern California Edison Co., Alhambra, sponsor; overhead transmission and distribution, W. A. Howe, Westinghouse Electric Corp., San Francisco, sponsor; underground transmission and distribution, C. N. Parker, California Electric Power Co., Riverside, sponsor; steam generation, C. L. Hathaway, San Diego Gas & Electric Co., sponsor; and substation, P. L. Savage, General Electric Co., Los Angeles, sponsor.

Alf Hansen, General Electric Co., San Francisco, is chairman of the Operating Economics Section, and P. H. Adams, San Diego Gas & Electric Co., is vice-chairman. R. E. McCann, Southern California Edison Co., is chairman of the section's safety committee.

Accounting

The accounting section of the Administrative Services Section of PCEA will hold a joint meeting with its counterpart in the Pacific Coast Gas Assn. at the Hollywood-Roosevelt Hotel on April 17 and 18. Subjects planned for discussion are: tabulating equipment and its utilization, C. N. Rudkin, Southern California Edison Co., discussion leader; development of unit costs and manpower standards, J. T. McNab, Central Arizona Light & Power Co., discussion leader; right of way and land problems, B. K. Dunshee, PG and E, discussion leader; and centralization versus decentralization, H. C. Hammond, Southern Counties Gas Co., discussion leader.

The Administrative Services Section also has joint committees with the Pacific Coast Gas Assn. on: destruction of records (including microfilming), E. J. Wright, San Diego Gas & Electric Co., chairman; and NARUC standardization of accounts, J. S. Green, Southern California Gas Co., chairman.

Dexter Stoner, Coast Counties Gas & Electric Co., Santa Cruz, is chairman of the Administrative Services Section; H. L. Moore, Southern California Edison Co., Los Angeles, is vice-chairman.

Business Development

The Business Development Section will meet in groups and committees on April 24, 25, at the Hotel Huntington, Pasadena.

Committees are: 4-H Club electricity, E. G. Stahl, PG and E, San Francisco, chairman; residential adequate wiring, E. W. Meise, San Diego Gas & Electric Co., chairman, Gordon F. Black, Rome Cable Co., San Francisco, vice-chairman; school lighting, Ralph J. Crump, UCLA, chairman, J. E. Barnes, PG and E, San Rafael, vice-chairman; liquified petroleum gas, Dale MacKenzie, General Electric Co., San Francisco, chairman, Wayne Matthews, Coast Counties Gas & Electric Co., Hollister, vice-chairman; television, J. C. Chamberlain, Bureau of Home Appliances of San Diego County, chairman, Walter Lind, PG and E, San Francisco, vice-chairman; and home economics, Pauline Eliker, Southern California Edison Co., Los Angeles, chairman, Clara Sherburne, Hotpoint Inc., San Francisco, vice-chairman.

Groups are: home lighting, E. M. Tallon, Southern California Edison Co., Los Angeles, sponsor, W. E. Carlson, General Electric Lamp Dept., Oakland, co-sponsor; agricultural load building, S. H. Winter, General Electric Co., San Francisco, sponsor, W. L. Moats, Westinghouse Electric Corp., Los Angeles, co-sponsor; kitchen and laundry, H. J. Scaife, Hotpoint Inc., San Francisco, sponsor; industrial and commercial power and lighting, J. A. Corlett, General Electric Co., San Francisco, sponsor, L. D. Dame, Southern California Edison Co., Los Angeles, co-sponsor.

M. J. Sherwood, National Electrical Contractors Assn., San Francisco, is sponsor of the sub-group on industrial and commercial wiring; C. R. Long, Westinghouse Electric Corp., Los Angeles, is sponsor of the subgroup on industrial and commercial lighting; and J. H. Gumz, PG and E, San Francisco, is sponsor of the subgroup on industrial and commercial power.

H. C. Rice, Southern California Edison Co., Los Angeles, is chairman of the Business Development Section; V. C. Redman, PG and E, is vice-chairman.

Nominating Committee

Members of PCEA's nominating committee are: H. H. Courtright, PG and E, Fresno; L. G. Berger, Westinghouse Supply Corp., Los Angeles; A. D. Bragg, General Electric Co., San Francisco; C. C. Ernst, California Electric Power Co., Riverside; R. G. Holabird, National Electric Products Corp., San Francisco; Marshall Lasher, Hubbard & Co., Emeryville; R. D. Moody, Allis-Chalmers Mfg. Co., Los Angeles.

Budget and finance committee members are R. N. Dreiman, Coast Counties Gas & Electric Co., San Francisco, chairman; H. H. Courtright, PG and E, Fresno; J. F. Pollard, PG and E, San Francisco; Harold Quinton, Southern California Edison Co., Los Angeles; and R. W. Turnbull, General Electric Co., San Francisco.

George R. Best, General Electric Co., Los Angeles, is chairman of the membership committee; A. R. Bailey, Coast Counties Gas & Electric Co., San Francisco, is vice-chairman.

● **During its meeting** in San Francisco on Dec. 14, the Board of Directors authorized the publication of a four-page, letter-size bulletin for PCEA news to be mailed to all members not oftener than six times a year.

● **Instead of the May dates** previously announced, the annual PCEA convention this year will be held on June 11, 12, and 13. Hotel Coronado will be headquarters.

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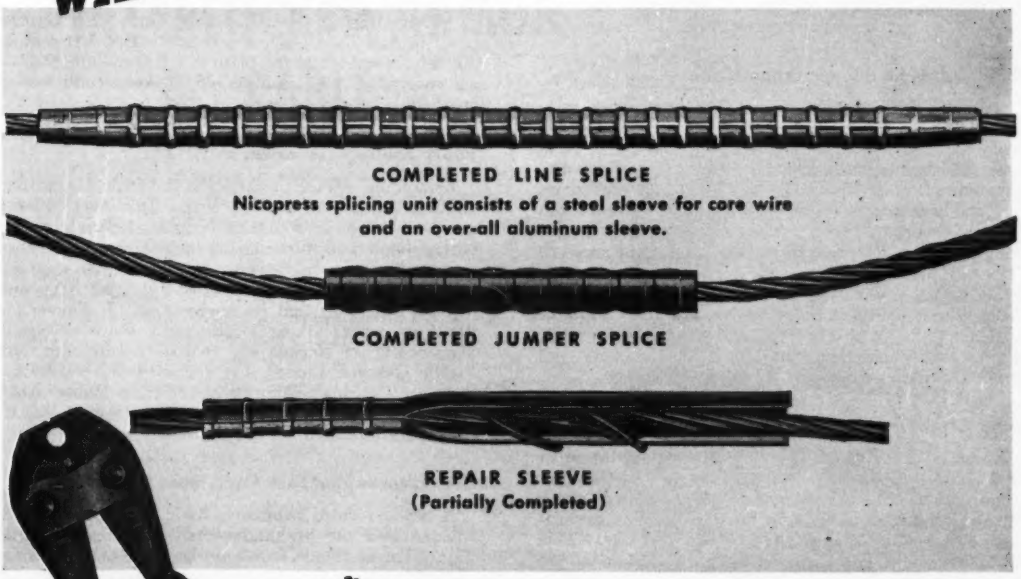

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THE MONTH IN BRIEF

Aller Files New Plan for WWP Sale

Another attempt to sell Washington Water Power Co. to three PUDs materialized the day after Christmas. Howard Aller, American Power & Light Co. president, filed a 300-page plan with the SEC whereby Chelan, Stevens and Pend Oreille county PUDs would take over the WWP common and then transfer it to a nonprofit membership corporation that would own and operate the Idaho portion of the system. A selling price of $65,115,000 is involved. Prior sale has been blocked by a court injunction that ruled that Washington PUDs could not own properties outside the state. The present plan attempts to circumvent the court injunction. Opponents of the sale call the proposal a "delaying action" because the SEC ordered American last October to present a dissolution program by Jan. 8, 1952. Idaho Attorney-General Robert E. Smylie and the Spokane Chamber of Commerce have both requested the SEC to take jurisdiction over the proposed sale. Previously the SEC had ruled that it had no jurisdiction since the sale was to public agencies.

FPC Grants License for Pelton Dam

Pacific Northwest power supplies will receive an early 108,000-kw increase with the granting of a Federal Power Commission license to Portland General Electric Co. for the controversial Pelton project on the Deschutes River. The plant is one of the nonfederal projects that can be completed within two years and thus augment the short power supply caused by the long construction schedules for the big federal projects. The $22 million Deschutes River plant had been opposed by Oregon fisheries interests and sportsmen who held that it would damage the salmon and steelhead runs on the stream. The FPC found no basis for these claims and stated that plans for a fish hatchery and other facilities would actually improve fishing.

State Must Defend Both Sides

Because of conflicting public interests, the State of Washington will have to defend both sides in the legal contest over right of the federal government to grant Tacoma a license for its Cowlitz development, according to Attorney-General Smith Troy. The dams were prohibited by a law passed in the 1949 session of the legislature, but were given an FPC license in November. Sportsmen have demanded that the state oppose the program in the courts, questioning the commission's authority to supersede state law.

Arizona Merger Is One Step Nearer

Stockholders of Central Arizona Light & Power and Arizona Edison last month voted almost 90% in favor of merging the two companies. Basis of the merger would be exchange of 1¾ shares of Calapco common stock for one share of Arizona Edison common. Before the merger becomes effective, it must be approved by the Arizona Corporation Commission and the FPC.

PG and E Given Kings River License

Opposition of the USBR was again overridden last month when the Federal Power Commission reaffirmed its decision to license the Pacific Gas and Electric Co. Kings River hydro project. Interior Secretary Oscar Chapman had opposed the license on the grounds that USBR had plans for the Kings River basin development as a part of the Central Valley project. Construction has been delayed two years because of this opposition. Two new conditions were imposed on PG and E: (1) The term of the license was reduced from 50 to 30 years; (2) it requires that PG and E reach an agreement with local irrigation districts for use of the water for power generation prior to Oct. 15, 1952. The project involves 261,000 kw of new hydro capacity at a cost of approximately $75 million.

Third Unit Planned for Gadsby Plant

Engineering plans have been prepared for a third 75,000-kw unit at Utah Power & Light Co.'s Gadsby plant in Salt Lake City, it was announced last month. Already in service at the plant is a $10 million, 66,000-kw generator. A $13 million, 75,000-kw second section is scheduled for completion in 1952.

Power Shortage Threatens in Nevada

Expanding defense industries at the Basic Magnesium Industries plant in the Las Vegas area may cause a power shortage in southern Nevada. Officials of the Nevada-Colorado Commission, which has charge of power allotments in the area, have said that they are facing a shortage of 300 million kwh in 1952. The commission has instructed its engineer, A. J. Shaver, to draw up papers asking USBR for a share of Shasta Dam power for Nevada and to start negotiations with Pacific Gas and Electric Co. for wheeling power into the state. Nevada's share of power from Hoover Dam (741 million kwh annually) and Davis Dam (236,000) has been contracted for in full, Shaver said.

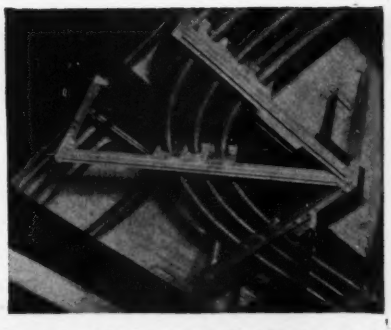
New Company to Take Over Basic Magnesium

A newly formed company, Basic Management Inc., will purchase the "residual assets" of the Basic Magnesium plant at Henderson from the State of Nevada for about $5 million, it was reported late last month. Assets include housing and land at the townsite; facilities for distributing power and water from Hoover Dam and for disposal of sanitary and industrial wastes; the plant railroad and street system.

Color Television Tube

The particular virtue of Dr. Lawrence's recently announced color television tube is that Lawrence is said to have solved the problem of quantity production at a price that will place color TV within the reach of the masses. Present TV color tubes are essentially laboratory models.

Give installation problems...



How one manufacturer solved a difficult installation problem through the use of flexible interlocked armor cable.

THE RUN-AROUND with INTERLOCKED ARMOR CABLE

Pillars, I-beams, piers, partitions, and other obstacles often interfere with the installation of new plant power circuits. Result? Expensive drilling, channeling and tricky layouts . . . extra plant downtime . . . increased over-all installation costs.

However, there *is* a simple low-cost solution—time-saving General Electric *interlocked armor cable with the famous No. 1799 varnished-cambric insulation.* This self-protecting cable was specifically designed to facilitate installation of plant power circuits in difficult locations. A ready-to-install cable assembly, G-E interlocked armor cable may be readily bent around obstructions. It can be strung over long runs without pull boxes. It need merely be laid up on existing beams or hung with wire brackets.

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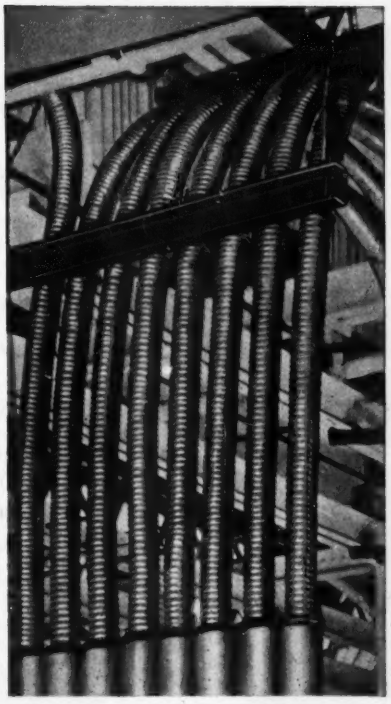
For complete data on General Electric interlocked armor cable, write to Section W3-125, Construction Materials Division, General Electric Company, Bridgeport 2, Connecticut.



General Electric interlocked armor cable runs around obstacles — needs no special installation techniques!

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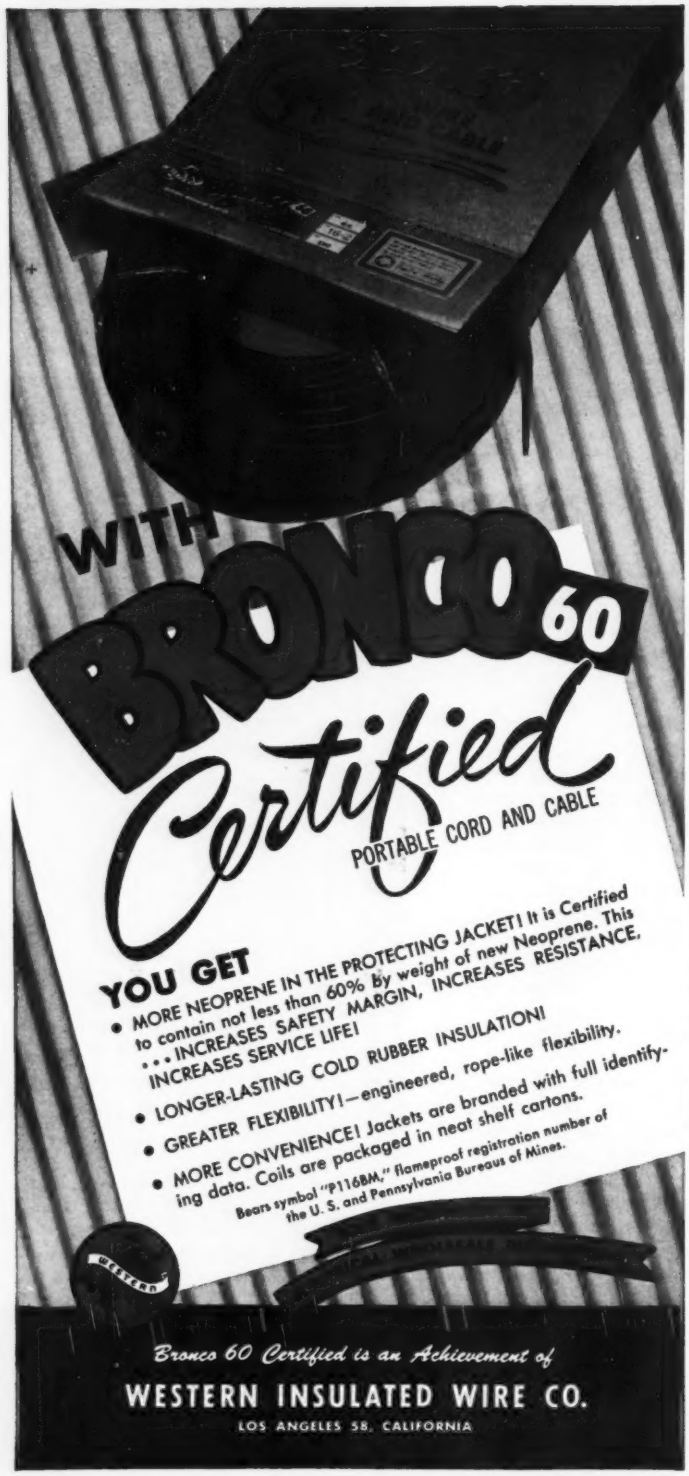
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THIS MONTH'S NEWS

Design Changes are Made on The Dalles Dam; Bids Called

A call for first bids and relatively drastic design changes for The Dalles Dam on the Columbia River were announced last month. The changes involve a switch from a complicated curved spillway to a straight one. However, they do not materially affect the estimated $10 million of coffer dam construction and power house excavation to be included in the first contract.

Portland District Engineer Thomas H. Lipscomb said that bids will be opened Jan. 22. He announced that the contract, which will be let as a whole to one bidder, will be on a continuing basis since the last Congress appropriated only $4 million with which to start work on the project.

The $350 million project is believed to be the largest single job from a dollar value standpoint ever undertaken by the federal government. That cost includes 14 units rated at 78,000 kw each. Ultimate installation when more upstream storage is developed will be 22 units.

Arapahoe Steam Plant Vital Link in Colorado System

Recent completion of Public Service Co. of Colorado's 132,000-kw. Arapahoe steam-electric plant in southeast Denver provides the vital link in a horseshoe of electric energy sources calculated to service the community with power up to one million population. Denver with suburbs approximates half that number at present.

The Arapahoe plant links up with the company's Lacombe steam plant in west Denver, hooks up with Valmont plant near Boulder and laces the girdle of a 115-kw electric energy ring around the "Queen City of the Plains." The belt system of high-voltage lines encircles the city like the rim of a wheel.

● **Seattle City Light** has announced plans to modernize its original substation, built in 1904, to increase its efficiency as power-load-dispatching headquarters, at an estimated cost of $88,000.

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All of these, and many other conditions for proper lighting of defense plants can be met through the specification of RLM-Labeled Lighting Units. All units bearing the RLM Label are warranted by Electrical Testing Laboratories to conform to the minimum standards established by the RLM Standards Institute for efficiency, durability and uniform quality.

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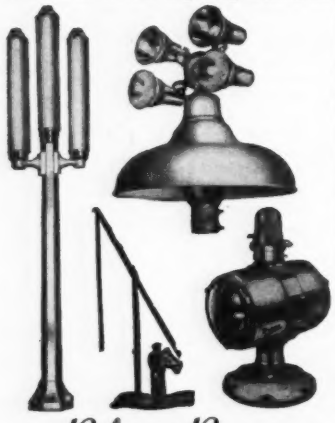

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THURSTON COUNTY FIRST TO APPROVE PURCHASE PLAN

Thurston County PUD of Olympia, Wash., is the first district to approve the plan for proposed $96,800,000 purchase of Puget Sound Power & Light Co. properties, subject to similar action by the six other PUDs involved in a joint purchase plan.

Under the plan, the Thurston PUD would issue $18,413,000 in revenue bonds, of which $9,049,000 would represent Thurston's share in the expense of buying the generating and transmission facilities, as well as distribution facilities in other counties, and $9,364,000 for the Thurston County distribution system. The latter figure includes $7,432,000 for the system itself $370,000 for current assets, $165,000 for working cash, $835,000 for construction cash and $562,000 for bond discount and expenses.

The Thurston action followed approval of the plan by J. Samuel Hart, Chicago engineer, engaged by the PUD as consultant. The Thurston PUD commission selected Hy Haskett, its secretary, as its representative on the seven-man committee, which would manage the pooled generation and transmission properties for the PUDs, selling power to its members at the basic $17.50 per kw-year rate set by Bonneville.

Meanwhile, extent to which the other PUDs would participate in the transaction has been announced by R. W. Beck of Seattle, whose firm of consulting engineers has conducted an engineering survey and presented a cost report on the $115 million project for a committee representing the PUDs.

Whatcom PUD of Bellingham would account for the largest share, $25,010,000, followed by Kitsap PUD of Bremerton, $24,448,000, Skagit of Mount Vernon, $19,549,000, Jefferson of Port Townsend, $9,482,000, and Snohomish of Everett and Chelan of Wenatchee, $9,049,000 each.

Of the $115 million total bonds, $93 million is considered as the sum to be offered for the Puget system, with the company to get an additional $3,800,000 for current assets. The balance of the $115 million would go for working capital, expenses of acquisition, etc.

The seven PUDs would participate equally, to the extent of $9,049,000 each, in a $63,343,000 "pool" bond issue, which will buy the transmission and generating facilities, as well as distribution facilities in counties not represented by the seven PUDs. This issue would include $49,914,000 for the physical properties, $5 million for a cash reserve, $1,847,000 for current assets and the balance for construction and working cash, bond discount, commissions and other expenses.

Of the $19,549,000 Skagit share, $9,049,000 would be for the pool, $8,493,000 for the distribution system in Skagit County and on adjacent Whidby Island in Island County, $425,000 for current assets, $189,000 for working capital, $763,000 for construction capital and $630,000 for discounts and costs. Skagit would be paid $40,000 by the pool as reimbursement for expenses in the 1945 attempt to buy the Puget Power system as agent for the other PUDs, an attempt that was ruled illegal.

● **Voters at Puyallup,** Wash., rejected a proposal, by a vote of 1,213 to 1,188, that the city purchase facilities of the Puget Sound Power & Light Co. within the city. The purchase was proposed because Pierce County, in which Puyallup is located, has no PUD and hence Pierce County properties of the power company would be managed by other PUDs in the state.

● **City fathers** at Chewelah, Wash., have turned down proposals to lease the municipal light and power distribution system to either a public or private power group. Lack of finances and manpower had prompted the proposals for leasing the system, which has operated successfully for more than 40 years.

● **Steam from** Pacific Northwest coal could produce power at a cost of less than 4 mills per kw, "extremely comparable" with hydroelectric costs, D. W. Harris, engineer of Seattle, Wash., told the Northwest Coal Utilization Conference at Centralia, Wash. This figure is based on a 300,000-kw plant operating at an 80% load factor and with modern combustion methods.

● **President Arthur Prager** of the Public Service Co. of New Mexico has announced plans by which the company would double its common stock. Two new shares of common stock with par value of $5 would be exchanged for each outstanding share of present stock, with par value of $7. The company now has 605,978 shares of common with a total par value of $4,241,846. Par value of the new stock would total $6,059,780, Prager said. The company has been paying $1 per share in dividends annually and Prager said that the directors have authorized dividends totaling 56c yearly on the new stock.

UTILITY MAY BE SUBJECT TO FPC LICENSING

The Federal Power Commission has ordered California Oregon Power Co. to show cause why its existing hydroelectric projects on the Klamath River should not be operated under a federal license.

The company was told to determine whether these developments are subject to FPC jurisdiction and, if so, whether they were being operated according to FPC regulations.

FPC also directed California Oregon Power to show cause why the commission should not issue an order prohibiting the further operation of the projects unless a license is obtained.

The issue arose when the company applied for a license for a proposed project and alluded to other projects already in existence.

The show-cause order must be answered in 60 days.

State License Granted for Two Hydroelectric Plants

A license covering construction and operation of two hydroelectric plants on the Clearwater River in southwestern Oregon has been issued to the California-Oregon Power Co. by the Oregon State Hydroelectric Commission. Cost of the project is estimated at $5.5 million.

Unit No. 1 of the new project will consist of a rock-filled timber crib dam and a power house containing a 21,000-hp impulse turbine directly connected to a 15,000-kw generator.

Unit No. 2, located a short distance below the unit No. 1 power house, also will have a rock-filled timber crib dam, with a power house containing a 38,000-hp turbine connected to a 26,000-kw generator.

A short transmission line will connect the two new units with the Tokette-Dixonville transmission line which feeds into the California-Oregon system.

● **Sperling substation** of B. C. Electric Co. was recently put in operation at Arbutus St. and King Edward Ave., Vancouver, B. C. The station adjoins the old Point Grey substation, which it replaces. The former Point Grey station will be converted into a rectifier station for changing a-c into d-c for use of trolley buses and trams. The new Sperling station is named after R. H. Sperling, general manager of B. C. Electric from 1905 until 1914.

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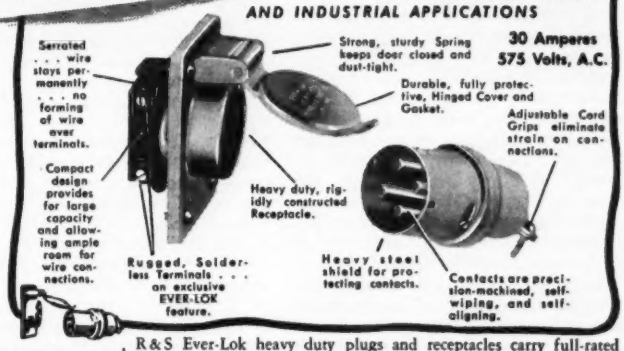
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PS OF COLORADO MAY SUPPLY ATOMIC PLANT

Because of the nature and the quality of service required by the AEC present indications are that Public Service Co. of Colorado will win the award to supply power for the Atomic Energy Commission's Rocky Flats Atomic plant, near Boulder, Colo.

David W. Persons, AEC project engineer for Rocky Flats' $45,000,000 establishment, says he "is going to try to get set up by next July" on the plant's power supply. Since the USBR will not be in a position to supply energy from the Colorado-Big Thompson project until "late in 1953," the federal agency appears eliminated from the bidding.

Public Service company is already supplying power for contractors on the Rocky Flats job.

Though the peak requirements for the new AEC plant have not been made public, it is known that AEC requires "very strict dependability" and "top quality service." Public Service company now has three high-tension lines serving the Rocky Flats area, and the two major steel-tower lines—one from Valmont steam plant and the other from the Boulder canyon hydro plant—are less than four miles apart at the atom plant site. Supplementing these sources are PSC of Colorado's Lacombe and Arapahoe steams plants in Denver.

The issue of public vs private power for the big Rocky Flats job, now under construction, was raised some months ago by H. Vance Austin of Sterling, Colo., manager of the Colorado State Association of REA Cooperatives, who protested that no effort had been made to bring Colorado-Big Thompson energy into the picture. Subsequently, the USBR entered into negotiations with the Atomic Energy Commission with a view to supplying current from Big Thompson generating units, which have been placed in service for certain limited areas. This study showed that the Colorado-Big Thompson job is a fully integrated project and cannot be operated efficiently until all its major works are completed. The Green Mountain plant, on the western slope, and those at Estes Park and Mary's Lake are being operated now, providing peaking power for Public Service company, which buys the energy on a "wheeling" basis. Lower Eastern Slope phases of the Colorado-Big Thompson remain to be finished.

John E. Loiseau, president of PSC of Colorado, has pointed out to AEC commissioners that, if his firm gets the Rocky Flats contract, it will pay taxes on facilities installed, whereas the USBR would pay none. The probable difference in rates would be 9 mills to 1.1c per kilowatt-hour, according to Loiseau's tentative estimate for complete electrical service, as opposed to the USBR's prevailing 7.1 mills per kilowatt-hour on a 50% load factor, with negotiated reductions as the load factor increases.

Montana Company Plans Big Horn Development

Big Horn Canyon Irrigation and Power Co., Hardin, Mont., has asked FPC for a permit covering a proposed hydro development on the Big Horn River in Montana and Wyoming. The project would include an arched gravity concrete dam about 480 ft high, forming a reservoir with approximately 830,000-acre-ft capacity and a power house with capacity of 210,000 hp. Stored water would be used to generate power and to irrigate 50,000 acres of new land in the valley below the dam. The power would be delivered to Hardin, where it would be fed into lines of Montana Power Co. and the Big Horn County Electric Cooperative. A permit issued in 1922 to the same company for a project at virtually the same site expired in June 1925.

Milton-Freewater Takes Over Company Lines

In an agreement between Pacific Power & Light Co. and Milton-Freewater, Ore., the municipality agreed to purchase the company's distribution lines in the former city of Freewater and certain rural areas for $147,414. Milton and Freewater, formerly separate municipalities, were consolidated last spring. Freewater was served by PP&L and Milton by a municipally owned system. Lines to be acquired under the purchase serve some 450 customers with an annual revenue of about $40,000.

● **FPC** has issued a six-month preliminary permit to Montana Power Co. for studying a hydro project on the Clark Fork River in Sanders County, Mont. The development would consist of a concrete dam near the mouth of Trout Creek about 25 miles downstream from Thompson Falls, a 24-mile-long reservoir, a power house with installed capacity of 175,000 hp and provision for additional units, a 230-kv transmission line.

SEATTLE WILL ENFORCE NEW HEATING RATES

Seattle City Council has refused to delay enforcement of new electric heating rates, scheduled for Jan. 1, as requested at a public hearing attended by several hundred owners of electric furnaces.

Councilmen upheld the contention of E. R. Hoffman, City Light superintendent, that the higher rates are justified. The new rates are about double former rates.

The controversy grew out of a 1947 ordinance which stipulated that residential customers using electricity for house heating should pay 1.8c for each kwh in excess of 1,200 kwh a month. The measure provided, however, that where such systems had been installed before Jan. 1, 1948, users would not pay the higher rate until Jan. 1, 1952, giving them time to convert to other types of heating. This delay also has been granted to customers taken over from Puget Sound Power & Light Co. earlier this year.

Opposition to the new rate came from the Electrical Consumers League, headed by Ben D. Riley, which now may try court action. The league contended that "this same rate has been refused to the private utilities by the Washington Public Service Commission, because it obviously discriminates between consumers."

Hoffman and John M. Nelson, assistant City Light superintendent, told the city council that the new rates were designed to reflect the actual costs of delivering power to service the homes. They found a ready champion in Councilman David Levine who asserted that his "coal bills have about doubled during the last ten years or so, but our City Light rates for general use have not been changed for many years."

About 3,000 homes in the Seattle area are heated with electricity.

● **Approval** was granted Central Arizona Light & Power Co. on Dec. 1 to raise electric and gas rates an average of 12½%, effective immediately. Calapco's application was filed in August, the first time in 30 years the company had sought a general rate increase.

● **FPC** has authorized Mountain States Power Co., Albany, Ore., to issue up to $7 million in 3¼% promissory notes, due Dec. 31, 1953, under a credit agreement with eight banks. Proceeds will be used in part to finance construction.

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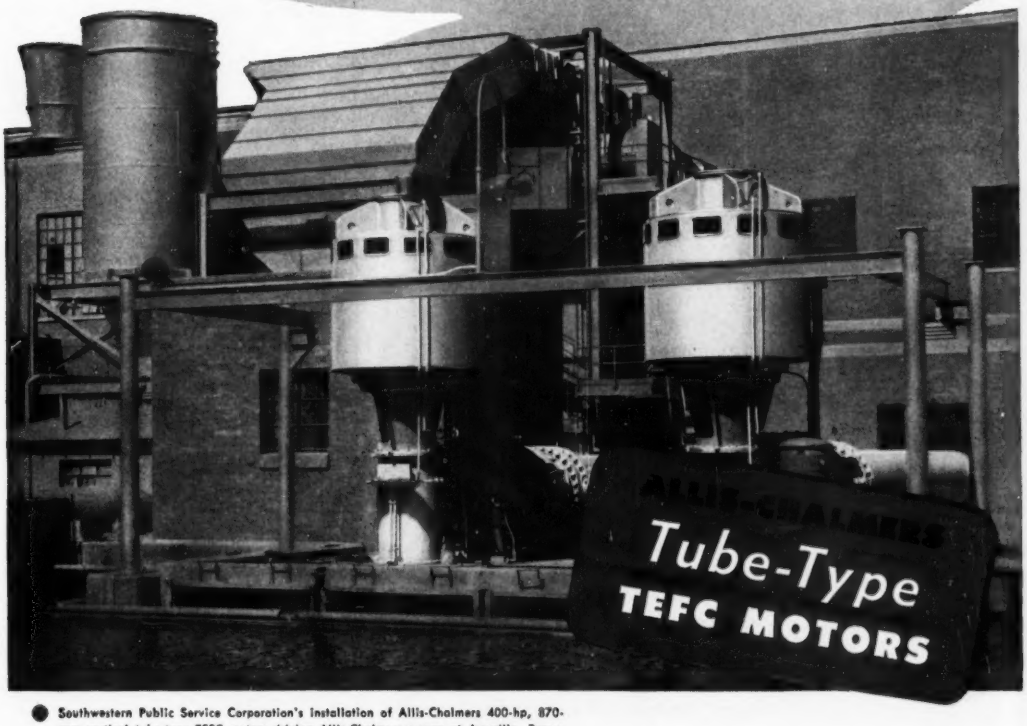

● Southwestern Public Service Corporation's installation of Allis-Chalmers 400-hp, 870-rpm vertical *tube-type* TEFC motors driving Allis-Chalmers pumps at Amarillo, Texas.

What does it cost to house a motor? Nothing — if it's an Allis-Chalmers *tube-type* totally-enclosed fan-cooled motor. Then the sky is roof enough. And it need not be blue sky either.

These motors aren't afraid of fog, rain, snow, salt, coal dust, soot, alkalies, or mild acids in the air. They're built to take care of themselves . . . and to save you money. The opportunity for low installation cost is only the beginning. Peak reliability and low maintenance pay worth-while dividends throughout the long life of the motors.

Why? Because their *tube-type* air-to-air heat exchanger design offers you these advantages:

1. *Self-cleaning action* . . . result of generous flow of outside air through smooth, straight cooling tubes.
2. *Complete enclosure* . . . protects stator core and other electrical parts from dirt and corrosion.
3. *Full internal air circulation* . . . provides efficient, even cooling—makes large sizes practical.

These are proved advantages, for purchases have exceeded 170,000 hp in sizes from 250 to 2500 hp. Introduced in 1946, *tube-type* motors are now available down to 40 hp at 600 rpm.

Bulletin 05B7150 describes these motors that are equally at home indoors or out. Call your A-C representative, or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-3534

Also available in horizontal designs.

ALLIS-CHALMERS

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LOOK FOR THE 20TH EDITION—APRIL 1952

Published annually as a supplement to the April issue by

ELECTRICAL WEST

68 POST ST. *SAN FRANCISCO 4, CALIF.*

230-KV SUBMARINE CABLE MAY CROSS PUGET SOUND

The world's first 230,000-v submarine cable will be laid across Puget Sound north of Seattle, Wash., in a welded-steel pipe if the next session of Congress approves funds requested by the Bonneville Power Administration.

The request for $6,107,000 already has been approved by the U. S. Budget Bureau.

The cable would extend 5½ miles from the Bonneville substation at Snohomish to the Olympic peninsula. Plans call for the cable to be laid in a 10-in welded-steel pipe, which would be filled with oil under pressure of 200 psi. The pipe would carry a heavy mastic coating to provide protection from corrosion in the salt water, ranging in depth to 600 ft.

Southern part of the peninsula now is served by a 115,000-v line, the northern part only by a 13,800-v Puget Sound Power & Light Co. cable.

Bids Called on Wiring For Atomic Plants

The Atomic Energy Commission has called for bids on two wiring systems to electrify and automatically protect the secrets of its Rocky Flats plant now under construction northwest of Denver, on the outskirts of Boulder.

One of the jobs, to entail $150,000-$200,000, is for an underground electrical distribution system, an overhead distribution system, and fence, street and parking lot illumination. The second will include a fire alarm system, supervisory circuits on sprinkler valves, a protective alarm system, a watchman's tour system and a safe protector system and various control systems at a maximum cost of about $150,000, on the estimates by the Austin Co., architect-engineer for Rocky Flats.

● **Southern Utah Power Co.**, Cedar City, Utah, has applied to FPC for authority to issue 15,761 shares of no par common stock. The stock would be offered at $11.50 per share to the company's common stockholders on the basis of one share for each four shares of common stock held. Any unsubscribed stock would be purchased by two underwriters, Smith Polian & Co. of Omaha, and Glidden, Morris & Co. of New York City. Proceeds are for the company's 1951-52 construction program.

MONTANA MAY GET NATURAL GAS FROM CANADA SOON

First major import of Canadian natural gas into the United States may start before the end of the year.

Pipeline from the Pakowki field in southeastern Alberta to connect with Montana Power Co. lines at Shelby, Mont., is scheduled to be completed and hooked up by Dec. 19, according to L. S. Stadler, Montana Power Co. gas division manager.

Only formality required is approval of the importation by the U. S. Federal Power Commission.

Export of the natural gas via the 56-mile $3.5 million pipeline was approved by the Alberta government as a defense production measure only, to power Anaconda Copper Mining Co.'s plants at Butte, Mont. Export of 43.8 billion cu ft over a five-year period was authorized last June, following a request by Charles E. Wilson, U. S. director of defense mobilization, for gas to supplement supplies from Montana Power's fields.

● **Ruling** that time is more important than money, the city purchasing agent of Seattle has awarded a $373,000 contract to the General Electric Co. for furnishing two 115-kv transformers for City Light. Ferranti Electric Co. of England was low bidder at $266,000 Nov. 27 but asked 40 months for delivery, while General Electric complied with the specified delivery time of 24 months.

● **University of California** at Davis will be the scene for the 24th Annual Rural Electric Conference sponsored by the California Committee on the Relation of Electricity to Agriculture. Sessions are scheduled for Feb. 4 and 5. Experts on various phases of farm electrification in the West will present the program.

● **Montana Power** Co., Butte, Mont., has asked for FPC authorization to issue $2 million in 2¾% promissory notes, due July 1, 1954. This is in addition to $10 million in 2½% notes authorized about a year ago. The additional money will be used in part for the Frank W. Bird steam plant.

● **A $1,745,130 contract** for construction of a 19½-mile transmission line on the Skagit hydroelectric project has been awarded by the Seattle Board of Public Works to M. A. Pithoud of Vancouver, Wash. The contract calls for a 230-kv double-circuit steel tower line upstream from Bacon creek to the Ross Dam power house.

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NOTES ON THE TRADE

Second Lighting Course Offered in San Diego

Those who could not get into the first lighting school conducted by Carlton M. Thompson of San Diego Gas & Electric Co. in the fall will have another chance when the second such course is offered again in January. The first school enrollment exceeded all expectations. It had been set for an original limit of 35 and was stretched to 48, but even so 44 more wanted to join the class and were asked to wait until the new classes in January.

First class was truly representative of the lighting industry in San Diego. It was made up of 9 architects, 9 architectural draftsmen, 5 electrical engineers, 14 electric wholesale salesmen, 7 electrical contractors, 1 manufacturers representative, 1 lamp company representative and 2 utility company men. It ran four Monday night sessions in October with an 87% attendance at all meetings.

The base for the study was the Westinghouse lighting course, "Illumination Fundamentals and Application," together with the Westinghouse lighting handbook as a text. This was given to the members of the class at the end of the session.

Excellent cooperation was received from many companies. Gus Larson of Westinghouse Electric Corp., presented "Light Sources" at the first session. Frank Van Gilluwe of Holophane Co. presented "Light Control" at the second session. Charles I. Brady Jr. of Sylvania Electric Products Inc. addressed the group the third session on "Store Lighting and What Color Fluorescent Lamps to Use in Stores." L. W. Towner, General Electric Co., presented "Flood Lighting and Floodlighting Design" at the last session.

"Although it is too early to predict what the effect of this schooling will be," said Thompson, engineer in charge of lighting sales, "we are finding already evidence of better design and better selling of lighting installations."

● **General Electric Lamp** division will build a new structure at Oakland, Calif., to house its sales, service and warehousing operations for northern California and Nevada. The division's Oakland service district will use the building also. It will be one story of concrete and wood construction; will have 61,000 sq ft of space. About 9,000 sq ft will be used for office space and the rest will be used to house G-E lamps.

Pacific Gas and Electric Co. supervisors and foremen witnessing an experimental installation of Preformed Line Products Co. guy wire attachments used in place of clamps

Manufacturer Adding to Sunnyvale Facilities

A $600,000 construction program at the Western headquarters plant of Westinghouse Electric Corp. at Sunnyvale, Calif., was scheduled for completion by the end of 1951.

Addition of a 55,000-sq-ft machine shop, a 25,200-sq-ft welding building and an 11,500-sq-ft prefabricated building for steel storage will give the plant floor space of 1,162,000 sq ft, making it seventh largest in working area of all Westinghouse plants in the nation.

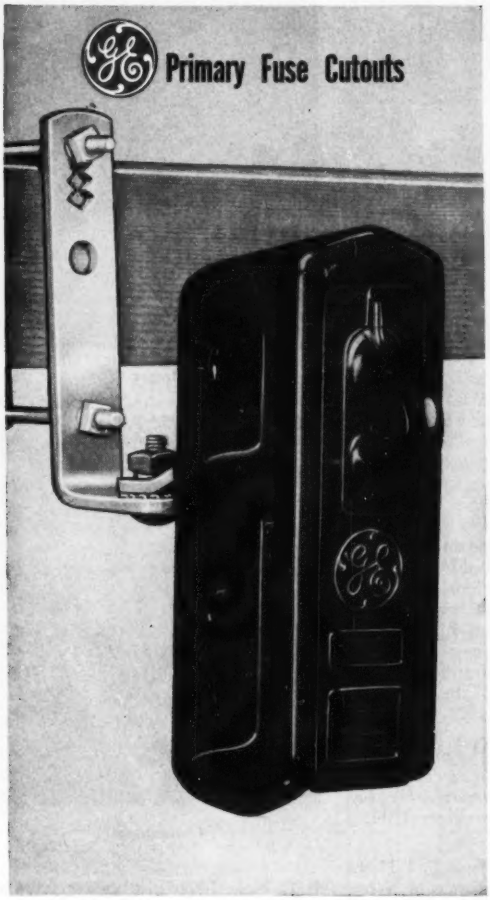
Largest of the new structures is the steel and reinforced concrete machine shop, 281x207 ft. It is lighted with 400-w fluorescent mercury lamps, which turn on automatically when the sunlight, filtered through a special plastic skylight, is not sufficient. Paint colors for machine tools and interiors were scientifically planned to assure maximum safety and comfort.

● **Because of increased business** resulting from atomic projects in the area, **Westinghouse Electric Supply Co.** opened a new office and warehouse in Albuquerque, N. M., Dec. 7, with **G. M. DeKraker** as manager. He formerly held a similar position at Lubbock, Tex. The 9,000-sq-ft, one-story structure will serve as temporary headquarters pending construction of a 25,000-sq-ft office, warehouse and display building. The new Wesco office will handle New Mexico sales and distribution for electrical apparatus, home appliances and supplies.

● **Square D Co.** has purchased a half block of land in the industrial section of Seattle, Wash., as the site for a new plant. The firm plans construction, during the next year, of a large plant, including factory and office facilities, according to E. R. Walton, Northwest manager.

● **Western Insulated Wire Co.**, manufacturer of Bronco portable electrical cords and cables, will hold its annual three-day sales convention at the Hotel del Coronado in San Diego, beginning Jan. 31, according to Murray H. Owen, sales manager.

● **D. R. Waugh** has been named general sales staff manager for Columbia Steel Co. in San Francisco.



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FLEXIBLE DISCONNECT BLADE CAN'T GET LOST! It's fastened to the door—can't be misplaced. This disconnect blade doubles the continuous current rating of the cutout. When the blade is disconnected and the door closed, the flexible cable extends downward to indicate that the circuit is open.

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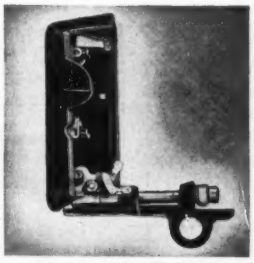
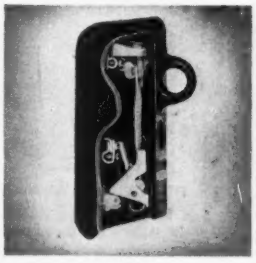
Indicating


Drop-out

Reclosing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NEWS ABOUT PEOPLE

New Appointments Made in PG and E Organization

Pacific Gas and Electric Co. has announced appointments of **Walter Dreyer** as vice-president and chief engineer, and **K. C. Christensen** as treasurer. Both appointments were effective Jan. 1. Dreyer replaces **I. C. Steele,** present vice-president and chief engineer, who will retire after 42 years with PG and E. Christensen succeeds **E. J. Beckett,** a 36-year veteran of the company, who will retire at the end of 1951.

Dreyer, who has been with the company for nearly 36 years, was graduated from the University of California in 1916 with a degree in civil engineering. He had worked for PG and E during summer vacations and joined the company full time upon graduation. Beginning as a surveyor, he became assistant engineer in charge of structural and hydraulic design in 1920; assistant chief of the division of civil engineering in 1929, and chief in 1944.

Christensen joined the organization in 1931 soon after being graduated from Stanford University. He has been assistant treasurer since 1944.

Dreyer

Christensen

● Retirement of **William P. L'Hommedieu,** assistant manager of Westinghouse Electric Corp.'s Pacific Coast district, was announced in December. He has been with the organization since 1906. Since 1939 he has been in charge of sales of electrical apparatus in nine Western states, Alaska and Hawaii. Previously he was Pacific Coast manager of the central station department. He is a past president of the San Francisco Electric Club and past chairman of the San Francisco Section, AIEE.

● **Charles C. Gadsby,** formerly in the advertising department, Pacific Gas and Electric Co., San Francisco, has been named manager, public relations and advertising, Marchant Calculating Machine, Oakland.

● **Lyman D. Morgan,** who has been in the Seattle office of Pittsburgh Reflector Co. for 25 years, was among those honored at the formation of the manufacturer's Permaflector Quarter Century club in Pittsburgh Dec. 6.

● **C. P. de Jonge** has been appointed general superintendent of San Diego Gas & Electric Co., succeeding **H. A. Noble,** recently promoted to vice-president in charge of operation. De Jonge will have supervision of electric production, transmission and distribution; gas transportation, and shops; buildings and grounds. He joined the company in 1930 as inspector in the gas department.

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● **R. W. Hutchinson** has been appointed eastern division manager of Pacific Electric Mfg. Corp., succeeding the late E. S. Kessler, it was announced in the company's San Francisco headquarters by Edward F. Sixtus, vice-president in charge of sales. Following graduation from the University of Washington in 1933, Hutchinson joined Westinghouse, leaving in 1941 for Naval service. His last Naval duty was head of the construction department of the 12th Naval District; his rank was commander. Before his promotion to eastern division manager, he had been manager of air switch sales at Pacific Electric's San Francisco plant.

● **Theodore Anderson,** chief of the electrical section in the Bureau of Reclamation's office engineering branch at Coulee Dam, Wash., has received an Award for Superior Accomplishment in developing an electrode-type heating plant that saves the government an estimated $4,000 yearly. The award includes a $200 yearly salary increase.

Deaths

● **David H. Foote,** 90, former vice-president and secretary and a director of Pacific Gas and Electric Co., died at his home in San Francisco Dec. 8. He had been in the utility field since 1903, when he became assistant secretary and assistant treasurer of the California Gas and Electric Corp., which was merged with the San Francisco Gas and Electric Co. in 1906 to form PG and E. Foote became a vice-president in 1912, director in 1914, vice-president and secretary in 1922, and vice-president and secretary-treasurer in 1927. He retired in 1943.

● **Gustave R. Hartwig Sr.,** founder of the Hartwig Electric Co., a contracting and retail firm in Seattle in 1906 (now out of business), died in Seattle recently. He was 72 years of age. Mr. Hartwig retired in 1945.

● **Charles B. Graham,** 58, died recently at his home in Vancouver, B. C. He was a director of Graham Electric, which was established by himself and his brother at Vancouver.

● **E. S. Kessler,** Western division manager and plant manager at Gary, Ind., for Pacific Electric Mfg. Corp. of San Francisco, died recently after a long illness. He had been with the company for 26 years.

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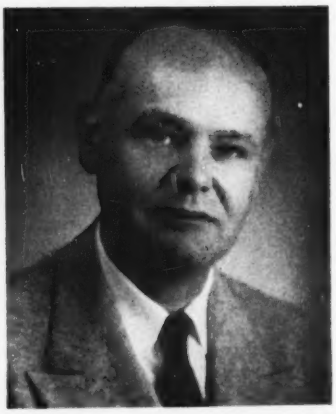
PROFILES

Although it isn't round, in San Diego they call it the Round Table, a lunch table in Maryland Hotel, where appliance men who like to eat together meet and talk shop. On one day recently J. Clark Chamberlain, left, had L. J. Perkins, G-E, of Los Angeles as guest. Others were Bob Jones, Ray Thomas Co.; Clarence Walker, Frigidaire; Dan Turner, sales trainer of SDG&E; Taylor Brown, Parmelee-Dohrmann Co.



O. Bert Hubenthal (above) has been named Seattle district manager of G-E Supply. R. W. Hutchinson (center right), who has been in Pacific Electric Mfg. Corp.'s San Francisco plant, succeeds the late E. S. Kessler as eastern manager. C. P. deJonge (lower right) has been advanced to San Diego G&E general superintendent

Expanding Burndy Service to You— new home for Burndy executive offices; engineering, development, and research departments; accounting, advertising, and sales departments.

Burndy's new home in Norwalk, Connecticut is the latest expansion in our 28-year history of steady progress—from a small beginning to our present 5 modern manufacturing plants in New York, California and Canada; a warehouse in Stamford, Connecticut; and 34 sales (meaning *service*) agencies throughout the country.

Burndy's consistent growth reflects the consistently superior performance of Burndy connectors... in joining, terminating, clamping, and grounding every variety of wire, cable, tube or bar which carries electricity.

BURNDY

BURNDY ENGINEERING COMPANY • NORWALK, CONNECTICUT

Cole Electric Co.

8439 Steller Drive TExas 0-4701 Culver City, Calif.

AIR BREAK DISCONNECTING SWITCH

34,500 volts—600 amperes—Type O-2

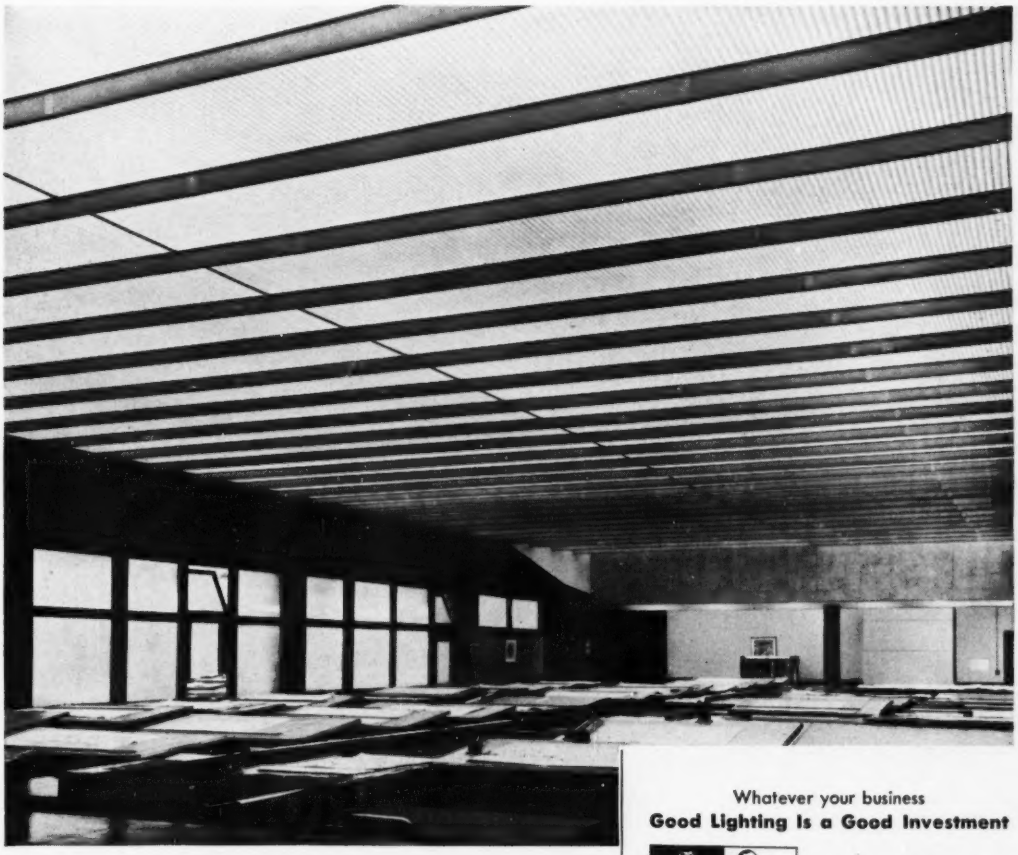
Vertical break. Three pole. Single throw. Group operated.

One pole shown.

SILVER TO SILVER CONTACTS

Luminous ceiling "as nearly perfect as we've ever experienced"...

—states Bechtel Corporation, San Francisco



Modern fluorescent lighting in Bechtel's new drafting rooms

Is Modern Lighting a good investment? The Bechtel Corporation of San Francisco certainly thinks so. In their newly modernized building, at 101 California St., nearly three miles of fluorescent lighting tubes were used.

The level of evenly diffused light is rated by their engineers as "very good, even for fine detailed work," and officials of the company state "Our new lighting, with the luminous ceiling in our drafting room, is as nearly perfect as our draftsmen have ever experienced."

Whatever your business
Good Lighting Is a Good Investment

Increases production, sales

Reduces waste

Keeps employees happy, efficient

Reduces accidents

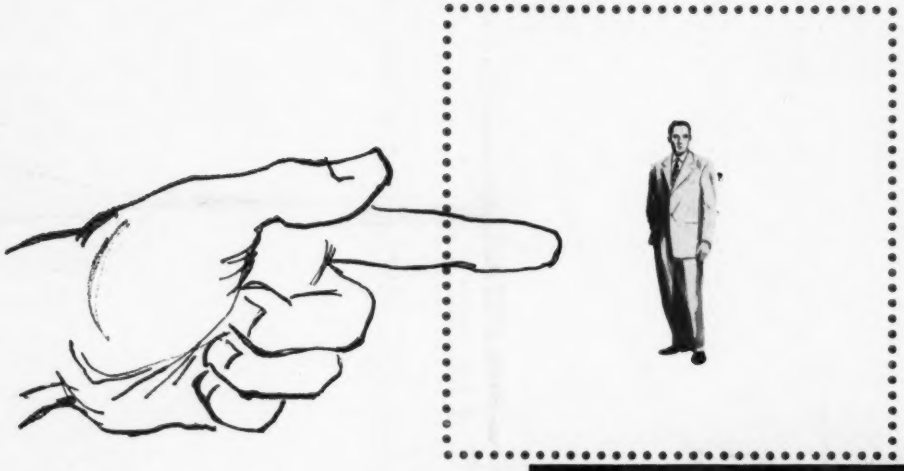
Increases cleanliness

For a survey of your lighting and ideas on how better lighting can help you, call the lighting engineer at your P. G. and E. office, or consult your contractor or engineer.

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

1AX-52



This is your business, too!

Sure, you have a lot to do right in your own store, office, or plant, but there's a lot more to your business than that. The electric industry is a big one with dozens of branches, and every phase of it is important to every other phase.

That's why the Pacific Coast Electrical Association is especially important to you. P.C.E.A. is a "do something" organization in which men and women from all parts of the business work together for the benefit of each other and the betterment of the industry as a whole.

If you aren't a member we urge you to join. If you already belong we urge you to be as active as possible, because there is a definite place where you can help, and specific advantages you can gain from this Association.

WRITE FOR YOUR FREE COPY of the booklet "Your P.C.E.A. and How it Operates." That's a good way to get started, and now is a good time.

PACIFIC COAST ELECTRICAL ASSOCIATION

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